ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. XCIV, No. 4 — Thursday, January 28, 1932

Annual Bids Opened for Government Paper

Joint Congressional Committee on Printing Opens Sealed Proposals on Monday for Supplying the Government Printing Office With Paper for One Year Beginning March 1, 1932—The Successful Bidders Will Be Announced on Monday of Next Week, February 1—More Concerns Than Usual Make Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 25, 1932.—At the opening of bids for the supply of paper for the Government Printing Office for the year beginning March 1, 1932, today Hon. W. A. Lambeth of North Carolina was inducted as member of the Committee. A larger number of bids was received than for several years past; the included eleven bidders on envelopes and 46 bidders on paper supplies. Among the firms represented at the hearing was W. L. Jones, Inc., Barton, Duer & Koch, P. H. Glatfelter Company, Perkins-Goodwin Company, Aetna Paper Company, Old Dominion Paper Company, American Writing Company, Whitaker Paper Company, Virginia Paper Company, Union Envelope Company, United States Envelope Company, Stanford Paper Company, Reese & Reese, R. P. Andrews Paper Company, Whiting Paper Company and the Mathers-Lamm Paper Company.

The bids this year were requested on supplies for six months and for a year. Unless otherwise indicated the bids named below will be for the year and the six months any variation from this will be indicated.

News Print

No. 1—3,000,000 lbs., 24x36—64; rolls, 24, 36 and 48 ins. wide (3-inch fiber cores, with metal ends).

National Pulp & Paper Co., Inc., New York City		2.545 cents
International Paper Co., New York City		2.65 cents
Thos. J. McCormick Paper Corp., New York City		2.5485cents
Resolute Paper Products Corp., New York City		2.5425cents
R. P. Andrews Paper Co., Washington, D. C. (6 Months)		2.3375cents
Boston Paper Board Co., Boston, Mass. (I Year)		2.425 cents
Perkins-Goodwin Co., New York City (1 Year)		2.495 cents
The Old Dominion Paper Co., Norfolk, Va.		2.498 cents
Reese and Reese, Inc., Baltimore, Md.		2.6 cents
Barton, Duer & Koch., Washington, D. C.		2.535 cents
The Whitaker Paper Co., Baltimore, Md.		2.604 cents

Machine-Finish Book

No. 3—800,000 lbs., 25x38—70; flat, cut 24x32, 28x38, and 31¼x45½ ins.

Bryant Paper Co., Kalamazoo, Mich.	(6 Months)	4.40 cents
	(1 Year)	5.06 cents
R. P. Andrews Paper Co.		3.59 cents
P. H. Glatfelter Co., Spring Grove, Pa.		4.09 cents
Barton, Duer & Koch		3.795 cents
Whitaker Paper Co.		3.838 cents

No. 4—1,000,000 lbs., 25x38—70; flat, cut 24x38 and 38x48 ins.

Bryant Paper Co.	(6 Months)	4.40 cents
	(1 Year)	5.06 cents
R. P. Andrews Paper Co.		3.59 cents
P. H. Glatfelter Co.		4.03 cents
Barton Duer & Koch		3.795 cents
The Whitaker Paper Co.		3.838 cents

No. 5—1,000,000 lbs., 25x38—70; flat, cut 24x38 and 38x48 ins.

Bryant Paper Co.	(6 Months)	4.40 cents
	(1 Year)	5.06 cents
R. P. Andrews Paper Co.		3.59 cents
P. H. Glatfelter Co.		4.09 cents
Barton, Duer & Koch		3.795 cents
The Whitaker Paper Co.		3.838 cents

No. 6—800,000 lbs. 25x38—70; rolls, 18, 21, 23 and 28½ ins. wide (3-inch iron cores).

Bermingham & Prosser, Kalamazoo, Mich.		3.72 cents
Bryant Paper Co.	(6 Months)	3.89 cents
	(1 Year)	4.47 cents
R. P. Andrews Paper Co.		3.26 cents
P. H. Glatfelter Co.		3.71 cents
Barton, Duer & Koch		3.545 cents
The Whitaker Paper Co.		3.578 cents

No. 7—1,500,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch iron cores).

Bryant Paper Co.	(6 Months)	3.89 cents
	(1 Year)	4.47 cents
R. P. Andrews Paper Co.		3.26 cents
P. H. Glatfelter Co.		3.62 cents
Barton, Duer & Koch		3.545 cents
The Whitaker Paper Co.		3.578 cents
Bermingham & Prosser		3.72 cents

No. 8—1,500,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch iron cores)

Bermingham & Prosser		3.72 cents
Bryant Paper Co.	(6 Months)	3.89 cents
	(1 Year)	4.47 cents
Virginia Paper Co. Inc., Washington, D. C.	(1 Year)	3.75 cents
R. P. Andrews Paper Co.		3.26 cents
P. H. Glatfelter Co.		3.62 cents
Barton, Duer & Koch		3.545 cents
The Whitaker Paper Co.		3.578 cents

No. 9—500,000 lbs., 25x38—70; rolls, 24, 36 and 48 ins. wide (3-inch iron cores).

Bermingham & Prosser		3.72 cents
Bryant Paper Co.	(6 Months)	3.89 cents
	(1 Year)	4.47 cents
R. P. Andrews Paper Co.		3.26 cents
P. H. Glatfelter Co.		3.71 cents
Barton, Duer & Koch		3.545 cents
The Whitaker Paper Co.		3.578 cents

No. 10—300,000 lbs., 25x38—80; rolls, 32 ins. wide (3-inch iron cores).

Bermingham & Prosser		3.72 cents
Bryant Paper Co.	(6 Months)	3.79 cents
	(1 Year)	4.36 cents
R. P. Andrews Paper Co.		3.25 cents
P. H. Glatfelter Co.		3.62 cents
Barton, Duer & Koch		3.545 cents
The Whitaker Paper Co.		3.448 cents

No. 11—1,300,000 lbs., 25x38—80; flat, cut 24x38, 33¼x64, and 38x48 ins.

Bryant Paper Co.	(6 Months)	4.235 cents
	(1 Year)	4.87 cents
R. P. Andrews Paper Co.		3.57 cents
P. H. Glatfelter Paper Co.		3.89 cents
Barton, Duer & Koch		3.74 cents
The Whitaker Paper Co.		6.98 cents

No. 12—600,000 lbs., 25x38—100; flat, cut 22¼x32¼, 24x38, 24¼x36¼, 32x42, 38x48, and 41x52 ins.

Bryant Paper Co.	(6 Months)	4.235 cents
	(1 Year)	4.87 cents
R. P. Andrews Paper Co.		3.51 cents
P. H. Glatfelter Paper Co.		3.89 cents
Barton, Duer & Koch		3.71 cents
The Whitaker Paper Co.		3.648 cents

No. 13—60,000 lbs., 25x38—120 and 140; flat, cut 24x30 (grain as orderd), 29x41, and 38x48 ins. Min. order 7,500 lbs.

Bryant Paper Co.	(6 Months)	4.30 cents
	(1 Year)	4.945 cents
R. P. Andrews Paper Co.		3.53 cents
P. H. Glatfelter Paper Co.		4.18 cents
Barton, Duer & Koch		3.91 cents
The Whitaker Paper Co.		3.948 cents

No. 14—60,000 lbs., blue and salmon, 25x38—70 and 100; flat, cut 25x38 and 38x48 ins. Min. order, one color, 5,000 lbs.

The Aetna Paper Co., Dayton, Ohio		5.17 cents
Barton, Duer & Koch		6.25 cents
The Whitaker Paper Co.		5.59 cents
Dobler & Mudge, Maltimore, Md.		5.70 cents

Machine-Finish Book End Paper

No. 16—100,000 lbs., flat, 25x38—160; the grain to run the 38-inch way.

R. P. Andrews Paper Co.		3.60 cents
P. H. Glatfelter Paper Co.		4.82 cents
American Writing Paper Co., Inc., Holyoke, Mass.		4.74 cents
The Old Dominion Paper Co.		4.386 cents
The Aetna Paper Co.		4.57 cents
Barton, Duer & Koch		4.18 cents

Antique Book

No. 17—125,000 lbs., 25x38—100; flat, cut 25x38 and 38x50 ins.

Bryant Paper Co.	(6 Months)	4.52 cents
	(1 Year)	5.20 cents
R. P. Andrews Paper Co.		3.52 cents
P. H. Glatfelter Paper Co.		4.52 cents
American Writing Paper Co., Inc.		4.58 cents
The Old Dominion Paper Company		4.287 cents
The Aetna Paper Company		4.37 cents
Barton, Duer & Koch		3.985 cents
The Whitaker Paper Company		4.77 cents

Lightweight Machine-Finish Book

No. 18—100,000 lbs., 25x38—60; flat, cut 32x48 and 38x48 ins.

Bryant Paper Company	(6 Months)	5.21 cents
	(1 Year)	5.99 cents
R. P. Andrews Paper Company	(1 Year)	5.41 cents
P. H. Glatfelter Company		5.78 cents
The Aetna Paper Company		5.17 cents
Barton, Duer & Koch		4.965 cents
The Whitaker Paper Company		4.878 cents

50 Per Cent Rag Lightweight High Machine-Finish Book

No. 19—125,000 lbs., 25x38—60; flat, cut 32x48 and 38x48 ins.

Hawthorne Paper Company, Kalamazoo, Mich		8.50 cents
R. P. Andrews Paper Company	(1 Year)	8.88 cents
The Aetna Paper Company		7.97 cents
The Whitaker Paper Company		7.91 cents

50 Per Cent Rag Machine-Finish Book

No. 20—150,000 lbs., 25x38—80; flat, cut 32x48 ins.

Patten Paper Company, Limited, Appleton, Wis. (1 Year)		6.59 cents
Hawthorne Paper Company		7.14 cents
R. P. Andrews Paper Company	(1 Year)	7.57 cents
Stanford Paper Company, Washington, D. C.	(o)	8.99 cents
American Writing Paper Incorporated		7.21 cents
The Aetna Paper Company		6.67 cents
The Whitaker Paper Company		6.62 cents

No. 21—450,000 lbs., 25x38—80; flat, cut 38x48 ins.

Patten Paper Company Limited	(1 Year)	6.59 cents
Hawthorne Paper Company		7.09 cents
R. P. Andrews Paper Company	(1 Year)	7.51 cents
Stanford Paper Company	(o)	8.34 cents
American Writing Paper Company, Incorporated		7.21 cents
The Aetna Paper Company		6.57 cents
The Whitaker Paper Company		6.62 cents

No. 22—100,000 lbs., 25x38—80 and 90; flat, cut any size, min. width 24 ins., max. width 42 ins.

Patten Paper Company	(1 Year)	6.59 cents
Hawthorne Paper Company		7.14 cents
R. P. Andrews Paper Company	(1 Year)	7.57 cents
Stanford Paper Company	(o)	8.99 cents
American Writing Paper Company		7.21 cents
The Aetna Paper Company		6.67 cents
The Whitaker Paper Company		6.62 cents

(o) Plus 49 cents per 100 pounds for L.C.L. Shipments.

75 Per Cent Rag Laid Antique Book

No. 23—80,000 lbs., 25x38—140. flat, cut 24x38 ins.; the laid marks to run the 24-inch direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Marquette Paper Co., Chicago, Ill.		10.83 cents
Hawthorne Paper Co.		10.19 cents
Whiting Paper Co., Philadelphia, Pa.	(1 Year)	13.50 cents
R. P. Andrews Paper Co.	(1 Year)	11.0 cents
Stanford Paper Company	(p)	8.45 cents
American Writing Paper Co., Inc.		8.54 cents
Reese and Reese, Incorporated	(6 Months) (w)	16.95 cents
The Aetna Paper Company		7.47 cents
Barton, Duer & Koch		10.25 cents
The Whitaker Paper Co.		9.24 cents
Dobler & Mudge		11.07 cents

100 Per Cent Rag Machine-Finish Book

No. 24—40,000 lbs., 25x38—90; flat, cut 24x38 ins.; the grain to run lengthwise of the sheet. Min. order, 5,000 lbs.

Worthy Paper Co. Association, North Agawam, Mass.	(a)	18.73 cents
Marquette Paper Company	(e)	17.80 cents
Hawthorne Paper Company	(g)	16.84 cents
Whiting Paper Company	(1 Year) (h)	20.9 cents
R. P. Andrews Paper Company	(1 Year) (m)	17.0 cents
Stanford Paper Company	(p)	18.19 cents
American Writing Paper Company, Inc.	(q)	17.32 cents
Reese and Reese, Incorporated	(6 Months) (w)	19.35 cents
(F. O. B. Government Printing Office.)		
Barton, Duer & Koch	(x)	19.10 cents
The Whitaker Paper Co.	(z)	17.23 cents

No. 25—130,000 lbs., 25x38—140; flat, cut 24x38 ins.; the grain to run lengthwise of the sheet.

Worthy Paper Co.		18.23 cents
Marquette Paper Co.	(e)	17.80 cents
Hawthorne Paper Co.	(g)	16.84 cents
Whiting Paper Co.	(1 Year) (h)	20.9 cents
R. P. Andrews Paper Co.	(1 Year) (m)	16.0 cents
Stanford Paper Co.	(p)	18.10 cents
American Writing Paper Company, Inc.	(q)	17.32 cents
Reese and Reese, Inc	(6 Months) (w)	19.35 cents
(F. O. B. Government Printing Office.)		
Barton, Duer & Koch	(x)	19.10 cents
The Whitaker Paper Co.	(z)	17.23 cents

Supercalendered Book

No. 26—120,000 lbs., 25x38—90; flat, cut 32x48 ins. Min. order 15,000 lbs.

Bryant Paper Co.	(6 Months)	4.485 cents
	(1 Year)	5.16 cents
R. P. Andrews Paper Co.		3.65 cents
P. H. Glatfelter Paper Co.		4.12 cents
Barton, Duer & Koch		3.935 cents
The Whitaker Paper Co.		3.878 cents

No. 27—550,000 lbs., 25x38—90; flat, cut 31¼x45½ ins.

Bryant Paper Co.	(6 Months)	4.485 cents
	(1 Year)	5.16 cents
R. P. Andrews Paper Co.		3.65 cents
P. H. Glatfelter Co.		4.12 cents
Barton, Duer & Koch		3.915 cents
The Whitaker Paper Co.		3.878 cents

No. 28—1,200,000 lbs., 25x38—90; flat, cut 24x38 and 38x48 ins.

Bryant Paper Co.	(6 Months)	4.485 cents
	(1 Year)	5.16 cents
R. P. Andrews Paper Co.		3.65 cents
P. H. Glatfelter Co.		4.12 cents
Barton, Duer & Koch		3.885 cents
The Whitaker Paper Co.		3.878 cents

No. 29—1,000,000 lbs., 25x38—90; rolls, 38 ins. wide (3-inch iron cores).

Bryant Paper Co.	(6 Months)	3.985 cents
	(1 Year)	4.58 cents
R. P. Andrews Paper Co.		3.31 cents
P. H. Glatfelter Co.		4.02 cents
Barton, Duer & Koch		3.545 cents
The Whitaker Paper Co.		3.578 cents

No. 30—1,000,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch iron cores).

Bryant Paper Co.	(6 Months)	3.985 cents
	(1 Year)	4.58 cents
R. P. Andrews Paper Co.		3.31 cents
P. H. Glatfelter Co.		4.02 cents
Barton, Duer & Koch		3.56 cents
The Whitaker Paper Co.		3.578 cents

No. 31—40,000 lbs., 25x38—90 and 100; flat, cut any size, min. width 24 ins., max. width 42 in. Min. order, one weight, 20,000 lbs.

Bryant Paper Co.	(6 Months)	4.41 cents
	(1 Year)	5.07 cents
R. P. Andrews Paper Co.		3.65 cents
P. H. Glatfelter Co.		4.28 cents
Barton, Duer & Koch		4.085 cents
The Whitaker Paper Co.		4.288 cents

50 Per Cent Rag Supercalendered Book

No. 33—40,000 lbs., 25x38—80 and 90; flat, cut 32x48 ins. Min. order, one weight, 12,500 lbs.

Hawthorne Paper Co.		8.14	cents
R. P. Andrews Paper Co.	(1 Year)	8.33	cents
Stanford Paper Company	L.C.L.	10.05	cents
	C.L.	9.47	cents
American Writing Paper Co., Inc.		7.59	cents
The Aetna Paper Co.		7.77	cents
The Whitaker Paper Co.		7.61	cents

Halftone Book

No. 34—250,000 lbs., 25x38—140; flat, cut 24x38 and 38x48 ins.

Bryant Paper Co.	(6 Months)	4.34	cents
	(1 Year)	4.99	cents
R. P. Andrews Paper Co.		3.82	cents
P. H. Glatfelter Co.		4.33	cents
The Whitaker Paper Co.		3.728	cents
Dobler & Mudge		3.91	cents

Single Coated Book

No. 35—350,000 lbs., 25x38—140; flat, cut 29x41, 38x48, and 41x52 ins.; the grain to run lengthwise of the sheet.

The Bryant Paper Co.	(6 Months)	5.80	cents
	(1 Year)	6.67	cents
Virginia Paper Company, Inc.	(1 Year)	6.115	cents
R. P. Andrews Paper Co.	(1 Year)	6.35	cents
Stanford Paper Co.		5.689	cents
Perkins-Goodwin Co.	(1 Year)	5.37	cents
Reese and Reese Inc.	(6 Months)	7.0	cents
	(1 Year)	7.5	cents
The Whitaker Paper Co.		5.788	cents

Double Coated Book

No. 36—100,000 lbs., 25x38—140 and 160; flat, cut 24x32, 24x38, and 38x48 ins.; the grain to run lengthwise of the sheet.

Bryant Paper Company	(6 Months)	6.31	cents
	(1 Year)	7.255	cents
Virginia Paper Co.	(1 Year)	6.413	cents
R. P. Andrews Paper Co.	(1 Year)	6.48	cents
Stanford Paper Co.		5.749	cents
Perkins-Goodwin Co.	(1 Year)	5.67	cents
Reese and Reese Inc.	(6 Months)	7.31	cents
	(1 Year)	7.81	cents
The Whitaker Paper Co.		6.038	cents

50 Per Cent Rag Double Coated Book

No. 37—180,000 lbs., 25x38—140 and 160; flat, cut 24x32, 24x38, 32x42, 38x48, and 41x52 ins.; the grain to run lengthwise of the sheet.

R. P. Andrews Paper Co.	(1 Year)	10.58	cents
Perkins-Goodwin Co.	(1 Year)	9.99	cents
Reese and Reese Inc.	(6 Months)	10.81	cents
	(1 Year)	11.31	cents
Lindemyer Paper Co., Baltimore, Md.		10.52	cents
The Aetna Paper Co.		9.47	cents
Barton, Duer & Koch		10.49	cents

Machine-Finish Lithograph

No. 39—70,000 lbs., 24x38—160; flat, cut 19x24 and 24x38 ins.; the grain to run lengthwise of the sheet.

R. P. Andrews Paper Co.		3.94	cents
P. H. Glatfelter Co.		4.74	cents
American Writing Paper Co., Inc.		4.64	cents
The Old Dominion Paper Co.		4.389	cents
The Aetna Paper Co.		4.47	cents
Dobler & Mudge		4.30	cents

50 Per Cent Rag Machine Finish Lithograph

No. 40—80,000 lbs., 25x38—160. flat, cut 26x38 ins.; the grain to run lengthwise of the sheet.

Hawthorne Paper Co.		7.64	cents
R. P. Andrews Paper Co.	(1 Year)	8.34	cents
Stanford Paper Co.	(C.L.)	7.70	cents
	(L.C.L.)	8.26	cents
American Writing Paper Co., Inc.		7.20	cents
The Aetna Paper Co.		6.97	cents
The Whitaker Paper Co.		7.96	cents

Chemical Wood Mimeograph, White and Colored

No. 43—1,700,000 lbs., white, Nos. 40 and 48; flat, cut 24½x30½, 24½x32, 24½x38, and 26x42½ ins:; the grain to run lengthwise of the sheet.

Marquette Paper Co.		4.62	cents
Virginia Paper Co., Inc.	(k)	3.94	cents
R. P. Andrews Paper Co.		3.61	cents
P. H. Glatfelter Co.		3.98	cents
Perkins-Goodwin Co.	(6 Months)	3.75	cents
	(1 Year)	3.87	cents
The Old Dominion Paper Co.		4.108	cents
The Aetna Paper Co.		3.97	cents
The Whitaker Paper Co.		3.638	cents
Dobler & Mudge		3.685	cents

No. 44—150,000 lbs., blue, buff, green, pink, and yellow, No. 40; flat, cut 24½x30½, 24½x32, 24½x38, and 26x42½ ins.; the grain to run lengthwise of the sheet. Min. order, one color, 10,000 lbs.

Thomas J. McCormick Paper Corp., New York City		5.82	cents
R. P. Andrews Paper Co.		5.97	cents
P. H. Glatfelter Company		6.04	cents
American Writing Paper Co., Inc.		6.03	cents
The Old Dominion Paper Co.		5.227	cents
The Aetna Paper Co.		4.97	cents
Barton, Duer & Koch		6.0	cents
The Whitaker Paper Co.		5.67	cents
Dobler & Mudge		5.08	cents

30 Per Cent Rag Mimeograph

No. 47—1,300,000 lbs., Nos. 40 and 48; flat, cut 24½x30½, 24½x32, 24½x38, 26x42½, and 28½x34½ ins.; the grain to run lengthwise of the sheet.

Patten Paper Co., Ltd.	(1 Year)	5.74	cents
Walker-Goulard Phlehn Co., Inc., New York City		8.00	cents
Cawthorne Paper Co., Inc., Richmond, Va.		5.908	cents
Corril A. Hubbard, Kalamazoo, Mich.		5.80	cents
R. P. Andrews Paper Co.	(1 Year)	5.80	cents
American Writing Paper Co.		5.87	cents
Perkins-Goodwin Co.	(6 Months)	5.40	cents
	(1 Year)	5.65	cents
The Old Dominion Paper Co.		5.938	cents
Lindemyer Paper Co.		6.18	cents
The Aetna Paper Co.		5.37	cents
Barton, Duer & Koch		6.06	cents
The Whitaker Paper Co.		5.738	cents

Blue U S M O Safety Writing, Safety or Sensitive Design

No. 51—700,000 lbs., No. 32; rolls, 11 and 22 ins. wide, 24 ins. in diameter (3-in iron cores).

George La Monte and Son, New York City		7.98	cents
R. P. Andrews Paper Co.		7.93	cents
The Perfect Safety Paper Co., Holyoke, Mass.	(1 year)	7.81	cents

U S M O Writing, White and Blue

No. 52—25,000 lbs., No. 32; rolls 8½ ins. wide, 24 ins. in diameter (3-inch iron cores). Min. order, either color, 4,000 lbs.

R. P. Andrews Paper Co.		7.34	cents
The Perfect Safety Paper Co.		7.15	cents

Safety Writing, Colored

No. 53—10,000 lbs., blue, gray, green, pink, salmon, and yellow, No. 40; flat, cut 17x28, 21x32, and 22x34 ins. Min. order, one color, 2,000 lbs.

George La Monte & Son		12.30	cents
Bishop Paper Company, Inc., New York City		11.75	cents
R. P. Andrews Paper Co.		11.90	cents
The Perfect Safety Paper Co.		11.90	cents
Barton, Duer & Koch		11.35	cents

Sulphite Writing, White and Colored

No. 55—1,000,000 lbs., white, No. 32; flat, cut 21x32, 22x34, 24x38, 26x34½, 28x34, and 32x42 ins.

Marquette Paper Co.		5.0	cents
Bryant Paper Co.	(6 Months)	4.90	cents
	(1 Year)	5.635	cents
R. P. Andrews Paper Co.		4.69	cents
Stanford Paper Co.		5.37	cents
American Writing Paper Co.		5.34	cents
The Old Dominion Paper Co.		4.232	cents
The Aetna Paper Co.		4.37	cents
Barton, Duer & Koch		4.81	cents
The Whitaker Paper Co.		4.338	cents
Dobler & Mudge		4.485	cents

No. 56—1,600,000 lbs., white, Nos. 40 and 48; flat, cut 21x32, 22x34, 23x36, 24x38, 28x34, 28x38, and 32x42 ins.; the grain to run the 38-inch way on the 28x38-inch size.

Cawthorne Paper Co.		4.24	cents
Marquette Paper Co.		5.0	cents
Bryant Paper Co.	(6 Months)	4.66	cents
	(1 Year)	5.36	cents
R. P. Andrews Paper Co.		4.69	cents
American Writing Paper Co., Inc.		5.14	cents
The Old Dominion Paper Co.		4.232	cents
The Aetna Paper Co.		4.27	cents
Barton, Duer & Koch		4.65	cents
The Whitaker Paper Co.		4.288	cents
Dobler & Mudge		4.385	cents

No. 57—100,000 lbs., white, No. 26; rolls, min. width 16 ins., max. width 38 in. (3-inch iron cores).

Cawthorne Paper Co.		4.93	cents
Bryant Paper Co.	(6 Months)	4.71	cents
	(1 Year)	5.415	cents
R. P. Andrews Paper Co.		4.96	cents
American Writing Paper Co., Inc.		5.24	cents
The Old Dominion Paper Co.		4.307	cents
The Aetna Paper Co.		4.77	cents
Barton, Duer & Koch		5.23	cents
The Whitaker Paper Co.		4.288	cents
Dobler & Mudge		4.742	cents

No. 58—400,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 38 ins. (3-inch iron cores).

Marquette Paper Co.		4.52	cents
Bryant Paper Co.	(6 Months)	4.46	cents
	(1 Year)	5.13	cents
R. P. Andrews Paper Company		4.42	cents
American Writing Paper Co., Inc.		4.74	cents
The Old Dominion Paper Co.		3.811	cents
The Aetna Paper Co.		3.97	cents
Barton, Duer & Koch		4.58	cents
The Whitaker Paper Co.		3.878	cents
Dobler & Mudge		4.095	cents

No. 59—500,000 lbs., white, Nos. 40 and 48; rolls, min. width 16 ins., max. width 38 ins. (3-inch iron cores).

Cawthorne Paper Co.		4.04	cents
Marquette Paper Co.		4.52	cents
Bryant Paper Co.	(6 Months)	4.25	cents
	(1 Year)	4.89	cents
R. P. Andrews Paper Co.		4.29	cents
American Writing Paper Co.		4.54	cents
The Old Dominion Paper Co.		3.811	cents
The Aetna Paper Co.		3.97	cents
Barton, Duer & Koch		4.42	cents
The Whitaker Paper Co.		3.778	cents
Dobler & Mudge		4.065	cents

No. 60—30,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 26; flat, cut 21x32, 22x34, 24x38, and 28x34 ins. Min. order, one color, 5,000 lbs.

American Writing Paper Co., Inc.		7.49	cents
The Old Dominion Paper Co.		6.497	cents
The Aetna Paper Co.		5.87	cents
Barton, Duer & Koch		7.0	cents
The Whitaker Paper Co.		7.50	cents
Dobler & Mudge		6.63	cents

No. 61—700,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, Nos. 32 and 40; flat, cut 21x32, 22x34, 24x38, 27x35, 28x34, and 32x42 ins. Min. order, one color, 10,000 lbs.

Cawthorne Paper Co.		4.92	cents
Marquette Paper Co.		5.50	cents
R. P. Andrews Paper Co.		5.39	cents
American Writing Paper Co., Inc.		5.87	cents
The Old Dominion Paper Co.		4.677	cents
The Aetna Paper Co.		4.67	cents
Barton, Duer & Koch		5.43	cents
The Whitaker Paper Co.		5.67	cents
Dobler & Mudge		4.95	cents

100 Per Cent Rag White Writing, Vellum Finish, Tub-Sized, Air-Dried

No. 63—5,000 lbs., No 56; flat, cut 21x32 ins. Min. order, 2,500 lbs.

R. P. Andrews Paper Co.	(1 Year)	19.35	cents
The Old Dominion Paper Co.		18.22	cents
Barton, Duer & Koch		19.0	cents

Lithograph-Finish Map

No. 64—40,000 lbs., Nos. 32 and 40; flat, cut 24x38, 30x40, 32x48, 36x52, and 38x48 ins. Min. order, one substance, 5,000 lbs.

Whiting Paper Co.	(1 Year)	8.25	cents
R. P. Andrews Paper Co.		8.27	cents
Stanford Paper Co.		7.826	cents
American Writing Paper Co., Inc.		7.45	cents
The Old Dominion Paper Co.		6.649	cents
The Aetna Paper Co.		5.97	cents

50 Per Cent Rag Lithograph-Finish Map, Tub-Sized, Air-Dried

No. 65—150,000 lbs., Nos. 40, 48, and 56; flat, cut 34x64, 36x44, 36x52, 38x44, 38x48, 40x52, 41x50, 44x54, and 44x64 ins.; the grain to run lengthwise of the sheet.

Whiting Paper Co.	(1 Year)	10.50	cents
R. P. Andrews Paper Co.	(1 Year)	11.34	cents
Stanford Paper Co.		10.504	cents
American Writing Paper Co., Inc.		10.73	cents
Barton, Duer & Koch		10.52	cents

75 Per Cent Rag Lithograph-Finish Map, Tub-Sized, Air-Dried

No. 66—200,000 lbs., Nos. 32 and 40; flat, cut 24x38, 30x40, 32x48, 36x52, 38x48, 40x52, and 44x64 ins.; the grain to run lengthwise of the sheet.

Whiting Paper Co.	(1 Year)	14.95	cents
Virginia Paper Co.	(1 Year)	13.92	cents
R. P. Andrews Paper Co.		13.23	cents
American Writing Paper Co., Inc.		13.84	cents
The Old Dominion Paper Co.	(s)	13.897	cents
Barton, Duer & Koch		13.47	cents

No. 67—30,000 lbs., No. 48 and 56; flat, cut 38x44, 41x50, 44x54, and 44x64 ins.; the grain to run lengthwise of the sheet. Min. order, one substance, 5,000 lbs.

The Whiting Paper Co.	(1 Year)	14.95	cents
Virginia Paper Co., Inc.	(1 Year)	13.92	cents
R. P. Andrews Paper Co.		13.23	cents
American Writing Paper Co., Inc.		14.34	cents
The Old Dominion Paper Co.	(s)	14.394	cents
Barton, Duer & Koch		13.47	cents

100 Per Cent Rag White Chart, Lithograph-Finish Tub-Sized, Air-Dried

No. 69—250,000 lbs., No. 96; flat, cut any size, min. width 22 ins., max. width 46 ins.; 4-inch band around each 500 sheets; the grain to run lengthwise of the sheet unless otherwise specified.

The Whiting Paper Co.	(1 Year)	19.0	cents
Virginia Paper Co.	(1 Year)	17.90	cents
R. P. Andrews Paper Co.	(1 Year)	16.27	cents
Stanford Paper Co.		18.04	cents
American Writing Paper Co.		17.44	cents
The Old Dominion Paper Co.	(s)	17.627	cents
Barton, Duer & Koch		16.50	cents

Sulphite Manifold, White and Colored

No. 70—150,000 lbs., white, No. 18; flat, cut 21x32, 22x34 and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size.

Cawthorne Paper Co.		6.64	cents
Marquette Paper Co.		6.99	cents
Corril A. Hubbard		6.84	cents
R. P. Andrews Paper Co.		7.10	cents
Perkins-Goodwin Co.	(1 Year)	7.198	cents
The Old Dominion Paper Co.		6.987	cents
Barton, Duer & Koch		7.0	cents
The Whitaker Paper Co.		6.50	cents
W. L. Jones, Inc., New York City		7.24	cents
Dobler & Mudge		6.245	cents

No. 71—60,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 18; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Cawthorne Paper Co., Inc.		7.73	cents
Marquette Paper Co.		8.17	cents
Corril A. Hubbard		8.50	cents
R. P. Andrews Paper Co.		7.87	cents
The Old Dominion Paper Co.	(C.L.)	7.728	cents
	(L.C.L.)	8.287	cents
The Whitaker Paper Co.		7.625	cents
W. L. Jones		7.80	cents
Dobler & Mudge		7.245	cents

50 Per Cent Rag Manifold, White and Colored

No. 73—100,000 lbs., white, No. 14; flat, cut 21x32, 22x34, 28x34, and 38x48 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 5,000 lbs.

Corril A. Hubbard		14.60	cents
Coy Disbrough & Co., Inc., New York City		15.15	cents
The Old Dominion Paper Co.		17.163	cents
Barton, Duer & Koch		13.25	cents
W. L. Jones, Inc.		14.85	cents

No. 74—450,000 lbs., white, No. 18; flat, cut 21x32, 22x34, 24x38, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size.

Corril A. Hubbard		12.125	cents
Coy Disbrough & Co., Inc.		13.0	cents
R. P. Andrews Paper Co.		12.39	cents
The American Writing Paper Co.		12.74	cents
Perkins-Goodwin Co.	(1 Year)	12.49	cents
W. L. Jones, Inc.		12.70	cents

No. 75—15,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 14; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 3,000 lbs.

The Old Dominion Paper Co.		19.989	cents
Barton, Duer & Koch		19.90	cents

No. 76—100,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 18; flat cut 21x32, 22x34, 24x38, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Corril A. Hubbard		14.11	cents
American Writing Paper Co., Inc.		14.94	cents
Perkins-Goodwin Co.	(1 Year)	14.49	cents
The Old Dominion Paper Co.		16.267	cents
Barton, Duer & Koch		14.85	cents
W. L. Jones, Inc.		15.00	cents

100 Per Cent Rag Manifold, White and Colored, Tub-Sized, Air-Dried

No. 78—10,000 lbs., white, No. 14; flat, cut 17x28, 19x24, 21x32, and 22x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 5,000 lbs.

Virginia Paper Co., Inc.	(1 Year)	32.81	cents
Old Dominion Paper Company		33.428	cents
The Whitaker Paper Co.		32.50	cents

No. 79—20,000 lbs., white, No. 18; flat, cut 17x28, 19x24, 21x32, and 22x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 5,000 lbs.

Virginia Paper Co., Inc.	(1 Year)	26.845	cents
The Old Dominion Paper Co.		27.974	cents
The Whitaker Paper Co.		27.50	cents

No. 80—5,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 14; flat, cut 17x28, 19x24, 21x32, 22x34, and 26x32 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order one color, 2,000 lbs.

Virginia Paper Co., Inc.	(1 Year)	34.80	cents
The Old Dominion Paper Co.		37.438	cents
The Whitaker Paper Co.		39.50	cents

No. 81—5,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 18; flat, cut 17x28, 21x32, 22x34, and 24x38 ins.; the grain to run the 21-inch way on the 21x32-inch. Min. order, one color, 2,000 lbs.

Virginia Paper Co., Inc.	(1 Year)	28.833	cents
The Old Dominion Paper Co.		31.98	cents
The Whitaker Paper Co.		34.50	cents

50 Per Cent Rag White Glazed Manifold

No. 83—80,000 lbs., No. 16; flat, cut 19x24 and 21x32 inch.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 20,000 lbs.

Corril A. Hubbard		17.82	cents
Coy Disbrough Co., Inc.		15.30	cents
R. P. Andrews Paper Co.		17.0	cents
W. L. Jones, Inc.		15.32	cents
Dobler & Mudge		16.67	cents

Sulphite Bond, White and Colored

No. 101—10,000 lbs., white, No. 36; flat, cut any size, min. width 17 ins., max. width 32 ins. Min order 5,000 lbs.

Cawthorne Paper Co., Inc.		5.83	cents
Virginia Paper Co., Inc.	(1 Year)	6.25	cents
R. P. Andrews Paper Co.		6.37	cents
The Old Dominion Paper Co.		6.19	cents
The Aetna Paper Co.		5.37	cents
Barton, Duer & Koch		5.95	cents
The Whitaker Paper Co.		5.988	cents

No. 102—700,000 lbs., white, Nos. 32 and 40; flat, cut any size, min. width 7 ins., max. width 32 ins.

Cawthorne Paper Co., Inc.		4.92	cents
Marquette Paper Co.		5.0	cents
Virginia Paper Co., Inc.	(1 Year)	5.50	cents
R. P. Andrews Paper Co.		4.87	cents
Stanford Paper Co.		5.37	cents
The Old Dominion Paper Co.		4.3799	cents
The Aetna Paper Co.		4.67	cents
Barton, Duer & Koch		4.725	cents
The Whitaker Paper Co.		4.538	cents

No. 103—10,000 lbs., white, No. 48; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order 5,000 lbs.

Cawthorne Paper Co., Inc.		5.03	cents
Virginia Paper Co., Inc.	(1 Year)	6.0	cents
R. P. Andrews Paper Co.		5.73	cents
Stanford Paper Co.		5.37	cents
The Old Dominion Paper Co.	(6 Months)	4.89	cents
	(1 Year)	4.99	cents
The Aetna Paper Co.		4.77	cents
Barton, Duer & Koch		5.53	cents
The Whitaker Paper Co.		5.288	cents

No. 104—10,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, Nos. 32 and 40; flat, cut any size, in. width 17 ins., max. width 32 ins. Min. order, one substance, one color, 2,000 lbs.

R. P. Andrews Paper Co.		6.27	cents
The Aetna Paper Co.		5.37	cents

No. 105—10,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 48; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co.		6.33	cents
The Aetna Paper Co.		5.47	cents

30 Per Cent Rag Bond, White and Colored, Tub-Sized, Air-Dried

No. 109—200,000 lbs., white No. 26; flat, cut 21x32, 23x36, 24x38, and 28x34 ins.

Whiting Paper Co.	(1 Year)	10.0	cents
American Writing Paper Co., Inc.		11.05	cents
The Aetna Paper Co.		10.97	cents
Barton, Duer & Koch		12.0	cents
The Whitaker Paper Co.		9.988	cents

No. 110—800,000 lbs., white, No. 32; flat, cut any size, min. width 17 ins., max. width 32 ins.

R. P. Andrews Paper Co.	(1 Year)	9.71	cents
American Writing Paper Co., Inc.		9.06	cents
The Aetna Paper Co.		8.47	cents
Barton, Duer & Koch		9.63	cents
The Whitaker Paper Co.		8.488	cents

No. 111—900,000 lbs., white, No. 40; flat, cut any size, min. width 17 ins., max. width 32 ins.

R. P. Andrews Paper Co.	(1 Year)	8.90	cents
American Writing Paper Co., Inc.		8.49	cents
The Aetna Paper Co.		7.97	cents
Barton, Duer & Koch		9.13	cents
The Whitaker Paper Co.		8.288	cents

No. 112—900,000 lbs., white, No. 40; flat, cut any size, min. width 17 ins., max. width 32 ins.

Hawthorne Paper Co.		7.78	cents
R. P. Andrews Paper Co.	(1 Year)	8.90	cents
American Writing Paper Co.		8.49	cents
The Aetna Paper Co.		7.97	cents
Barton, Duer & Koch		9.13	cents
The Whitaker Paper Co.		8.288	cents

No. 113—750,000 lbs., white, No. 48. flat, cut any size, min. width 17 ins., max. width 32 ins.

R. P. Andrews Paper Co.	(1 Year)	8.244	cents
American Writing Paper Co.		8.49	cents
The Aetna Paper Co.		8.07	cents
Barton, Duer & Koch		9.13	cents
The Whitaker Paper Co.		8.288	cents

No. 114—60,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 26; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one color, 5,000 lbs.

Whiting Paper Co.	(1 Year)	14.92	cents
American Writing Paper Co., Inc.		13.99	cents
The Old Dominion Paper Co.		13.738	cents
The Aetna Paper Co.		12.97	cents
Barton, Duer & Koch		15.83	cents

No. 115—250,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 32; flat, cut any size, min. width 17 ins., max. width 32 ins.

Whiting Paper Co.	(1 Year)	10.0	cents
American Writing Paper Co.		10.89	cents
The Old Dominion Paper Co.		10.198	cents
The Aetna Paper Co.		9.47	cents
Barton, Duer & Koch		11.47	cents

No. 116—250,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 40; flat, cut any size, min. width 17 ins., max. width 32 ins.

Hawthorne Paper Co.		9.08	cents
Whiting Paper Co.		10.0	cents
American Writing Paper Co.		9.69	cents
The Old Dominion Paper Co.		9.398	cents
The Aetna Paper Co.		8.47	cents
Barton, Duer & Koch		10.43	cents

No. 117—300,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 48; flat, cut any size, min. width 17 ins., max. width 32 ins.

Hawthorne Paper Co.		9.08	cents
Whiting Paper Co.	(1 Year)	10.0	cents
American Writing Paper Co.		9.69	cents
The Old Dominion Paper Co.		9.398	cents
The Aetna Paper Co.		8.47	cents
Barton, Duer & Koch		10.33	cents

50 Per Cent Bond, White and Colored, Tub-Sized, Air-Dried

No. 120—120,000 lbs., white, No. 26; flat, cut 21x32, 23x36, 24x38, and 28x34 ins.

The Baxter Paper Co., Baltimore, Md.		13.94	cents
Whiting Paper Co.	(1 Year)	13.50	cents
Virginia Paper Co., Inc.	(1 Year)	12.925	cents
R. P. Andrews Paper Co.	(1 Year)	13.14	cents
American Writing Paper Co.		13.17	cents
Barton, Duer & Koch		13.12	cents

No. 121—800,000 lbs., white, Nos. 32 and 40; flat, cut any size, min. width 17 ins., max. width 32 ins.

The Baxter Paper Co.		10.98	cents
Virginia Paper Co., Inc.	(1 Year)	10.44	cents
R. P. Andrews Paper Co.	(1 Year)	11.29	cents
American Writing Paper Co.		10.43	cents
The Aetna Paper Co.		9.07	cents
Barton, Duer & Koch		11.20	cents

No. 122—100,000 lbs., white, No. 48; flat, cut any size, min. width 17 ins., max. width 32 ins.

The Baxter Paper Co.		10.78 cents
Virginia Paper Co., Inc.	(1 Year)	10.44 cents
R. P. Andrews Paper Co.	(1 Year)	11.29 cents
American Writing Paper Co.		10.43 cents
The Aetna Paper Co.		10.25 cents
Barton, Duer & Koch		11.20 cents

No. 123—25,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 26, 32, and 40; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one color, one substance, 2,500 lbs.

Barton, Duer & Koch		14.20 cents

75 Per Cent Rag White Bond, Tub-Sized, Air-Dried

No. 125—5,000 lbs., No. 26; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order 2,500 lbs.

Whiting Paper Co.	(1 Year)	19.0 cents
Virginia Paper Co., Inc.	(1 Year)	17.648 cents
The Old Dominion Paper Co.		17.94 cents
Barton, Duer & Koch		17.50 cents

No. 126—5,000 lbs., Nos. 32, 40, and 48; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one substance, 2,500 lbs.

Whiting Paper Co.	(1 Year)	15.50 cents
Virginia Paper Co., Inc.		14.914 cents
The Old Dominion Paper Co.		14.43 cents
Barton, Duer & Koch		14.80 cents

100 Per Cent Rag White Bond, Tub-Sized, Air-Dried

No. 128—6,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one substance, 2,000 lbs.

Whiting Paper Co.	(1 Year)	20.0 cents
R. P. Andrews Paper Co.	(1 Year)	20.87 cents
The Old Dominion Paper Co.		18.94 cents
Barton, Duer & Koch		20.30 cents
The Whitaker Paper Co.		19.98 cents

No. 129—6,000 lbs., No. 48; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order 2,000 lbs.

Whiting Paper Co.		20.0 cents
R. P. Andrews Paper Co.	(1 Year)	20.87 cents
The Old Dominion Paper Co.		18.94 cents
Barton, Duer & Koch		20.30 cents
The Whitaker Paper Co.		19.98 cents

Declaration Bond, Tub-Sized, Air-Dried

No. 130—6,000 lbs., Nos. 32 and 40; flat, cut 17x22 and 22x25½ ins. Min. order, one substance, 3,000 lbs.

Whiting Paper Co.		21.50 cents
Barton, Duer & Koch		20.50 cents

Parchment Deed, White and Cream, Tub-Sized, Air-Dried

No. 131—4,000 lbs., No. 64; flat, cut 33x34 ins. Min. order 2,000 lbs.

The Old Dominion Paper Co.		18.21 cents
Barton, Duer & Koch		23.50 cents

Sulphite Ledger, White and Colored

No. 151—40,000 lbs., white, Nos. 56 and 64; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one substance, 10,000 lbs.

Cawthorne Paper Co.		5.67 cents
Virginia Paper Co., Inc.		5.966 cents
R. P. Andrews Paper Co		6.27 cents
Stanford Paper Co.		6.37 cents
American Writing Paper Co.		6.24 cents
The Old Dominion Paper Co.		5.938 cents
The Aetna Paper Co.		5.07 cents
Barton Duer & Koch		6.35 cents
The Whitaker Paper Co.		6.85 cents
Dobler & Mudge		5.80 cents

No. 152—50,000 lbs., white, No. 80; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order 10,000 lbs.

Cawthorne Paper Co.		5.67 cents
Virginia Paper Co. Inc.		5.966 cents
R. P. Andrews Paper Co.		6.27 cents
Stanford Paper Co.		6.37 cents
American Writing Paper Co.		6.24 cents
The Aetna Paper Co.		5.07 cents
The Whitaker Paper Co.		6.85 cents
Dobler & Mudge		5.80 cents

No. 153—12,000 lbs., blue, buff, green, pink, salmon, and yellow, No. 80, flat, cut 21x32½ ins. Min. order, one color, 2,000 lbs.

The Aetna Paper Co.		6.57 cents
The Whitaker Paper Co.		7.85 cents

30 Per Cent Rag Ledger, White and Colored, Tub-Sized, Air-Dried

No. 154—30,000 lbs., white, Nos. 48 and 56; flat, cut 20x28, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 5,000 lbs.

Hawthorn Paper Co.		8.83 cents
Whiting Paper Co.	(1 Year)	10.0 cents
R. P. Andrews Paper Co.		9.85 cents
American Writing Paper Co.		9.68 cents
Barton, Duer & Koch		9.77 cents

No. 155—10,000 lbs., white, No. 64; flat, cut 21x32 and 23x26 ins. Min. order 5,000 lbs.

Hawthorn Paper Co.		8.83 cents
Whiting Paper Co.	(1 Year)	10.0 cents
R. P. Andrews Paper Co.		9.85 cents
American Writing Paper Co.		9.68 cents
Barton, Duer & Koch		9.77 cents

No. 156—20,000 lbs., white, No. 72. flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Hawthorn Paper Co.		8.83 cents
Whiting Paper Co.	(1 Year)	10.0 cents
R. P. Andrews Paper Co.		9.85 cents
American Writing Paper Co.		9.68 cents
Barton, Duer & Koch		9.77 cents

No. 157—15,000 lbs., blue, buff, green, pink, salmon, and yellow, Nos. 56, 64, and 72; flat, cut 21x32, 23x36, 24x38, and 28x34 ins. Min. order, one substance, one color, 3,000 lbs.

Whiting Paper Co.	(1 Year)	11.0 cents
American Writing Paper Co.		11.31 cents
Barton, Duer & Koch		11.25 cents

50 Per Cent Rag Ledger, White and Colored, Tub-Sized Air-Dried

No. 160—100,000 lbs., white, Nos. 48 and 56; flat, cut 18½x36, 18½x40¼, 20x28, 21x32, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 10,000 lbs.

The Baxter Paper Co.		11.08 cents
Hawthorn Paper Co.		10.44 cents
Whiting Paper Co.	(1 Year)	11.25 cents
Virginia Paper Co., Inc.	(1 Year)	11.434 cents
R. P. Andrews Paper Co.	(1 Year)	10.47 cents
Stanford Paper Co.		10.898 cents
American Writing Paper Co.		10.83 cents
Barton, Duer & Koch		10.62 cents

No. 161—60,000 lbs., white, No. 64; flat, cut 21x32 and 23x36 ins. Min. order 10,000 lbs.

The Baxter Paper Co.		11.08 cents
Hawthorn Paper Co.		10.44 cents
Whiting Paper Co.	(1 Year)	11.25 cents
Virginia Paper Co., Inc.	(1 Year)	11.434 cents
R. P. Andrews Paper Co.	(1 Year)	10.47 cents
Stanford Paper Co.		10.898 cents
American Writing Paper Co.		10.83 cents
Barton, Duer & Koch		10.62 cents

No. 162—100,000 lbs., white, Nos. 72 and 80; flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order 10,000 lbs.

The Baxter Paper Co.		11.08 cents
Hawthorn Paper Co.		10.44 cents
Whiting Paper Co.	(1 Year)	11.25 cents
Virginia Paper Co., Inc.	(1 Year)	11.434 cents
R. P. Andrews Paper Co.	(1 Year)	10.47 cents
American Writing Paper Co.		10.83 cents
Barton, Duer & Koch		10.62 cents
The Whitaker Paper Co.		11.07 cents

No. 163—50,000 lbs., white, No. 88; flat, cut 21x32½ ins. Min. order 10,000 lbs.

The Baxter Paper Co.		11.08 cents
Whiting Paper Co.	(1 Year)	11.25 cents
Virginia Paper Co., Inc.	(1 Year)	11.434 cents
R. P. Andrews Paper Co.	(1 Year)	10.47 cents
Stanford Paper Co.		10.898 cents
American Writing Paper Co.		10.83 cents
Barton, Duer & Koch		10.62 cents

No. 164—110,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, Nos. 56, 64 and 72; flat, cut 18½x36, 18½x40¼, 19x24, 21x32, 23x36, and 28x34 ins. Min. order, one substance, one color, 5,000 lbs.

Hawthorn Paper Co.		11.44 cents
Whiting Paper Co.	(1 Year)	12.25 cents
Virginia Paper Co., Inc.	(1 Year)	12.428 cents
R. P. Andrews Paper Co.	(6 Months)	11.235 cents
Stanford Paper Co.		12.39 cents
American Writing Paper Co.		11.79 cents
Barton, Duer & Koch		11.60 cents

No. 165—60,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow, No. 88; flat, cut 21x32½ ins. Min. order, one color, 5,000 lbs.

Hawthorn Paper Co.	11.44	cents
Whiting Paper Co. (1 Year)	12.25	cents
Virginia Paper Co., Inc.	12.428	cents
R. P. Andrews Paper Co. (6 Months)	11.235	cents
American Writing Paper Co.	11.79	cents
Barton, Duer & Koch	11.60	cents
The Whitaker Paper Co.	12.27	cents

75 Per Cent Rag Ledger, White and Colored, Tub-Sized, Air-Dried

No. 168—30,000 lbs., white, Nos. 48 and 56; flat, cut 21x32, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 5,000 lbs.

The Baxter Paper Co.	13.90	cents
Hawthorn Paper Co.	12.72	cents
Whiting Paper Co. (1 Year)	13.0	cents
Virginia Paper Co. (1 Year)	13.92	cents
R. P. Andrews Paper Co. (1 Year)	13.19	cents
American Writing Paper Co.	13.24	cents
The Old Dominion Paper Co.	12.437	cents
Barton, Duer & Koch	12.40	cents
The Whitaker Paper Co.	13.70	cents

No. 169—40,000 lbs., white, No. 64; flat, cut 21x32, 23x36, 24x38, and 28x34 ins. Min. order 5,000 lbs.

The Baxter Paper Co.	13.90	cents
Hawthorn Paper Co.	12.72	cents
Whiting Paper Co. (1 Year)	13.0	cents
Virginia Paper Co. (1 Year)	13.92	cents
R. P. Andrews Paper Co. (1 Year)	13.19	cents
American Writing Paper Co.	13.24	cents
The Old Dominion Paper Co.	12.437	cents
Barton, Duer & Koch	12.40	cents
The Whitaker Paper Co.	13.70	cents

No. 170—25,000 lbs., white, Nos. 72 and 80. flat, cut 20x38, 21x32, 24x38, and 28x34 ins. Min. order, one substance, 5,000 lbs.

The Baxter Paper Co.	13.90	cents
Hawthorn Paper Co.	12.72	cents
Whiting Paper Co.	13.0	cents
Virginia Paper Co., Inc. (1 Year)	13.92	cents
R. P. Andrews Paper Co. (1 Year)	13.19	cents
Stanford Paper Co.	13.554	cents
American Writing Paper Co.	13.24	cents
The Old Dominion Paper Co.	12.437	cents
Barton, Duer & Koch	12.40	cents

No. 171—10,000 lbs., white, No. 88; flat, cut 21x32½ ins. Min. order 5,000 lbs.

The Baxter Paper Co.	13.90	cents
Whiting Paper Co. (1 Year)	13.0	cents
Virginia Paper Co. (1 Year)	13.92	cents
R. P. Andrews Paper Co. (1 Year)	13.19	cents
Stanford Paper Co.	13.554	cents
American Writing Paper Co.	13.24	cents
The Old Dominion Paper Co.	12.437	cents
Barton, Duer & Koch	12.40	cents

No. 172—20,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow. Nos. 56, 64, and 72; flat, cut 19x24, 21x32, 23x36, and 28x34 ins. Min. order, one substance, one color, 3,000 lbs.

Virginia Paper Co., Inc. (1 Year)	14.914	cents
R. P. Andrews Paper Co. (6 Months)	12.74	cents
American Writing Paper Co.	14.84	cents
The Old Dominion Paper Co.	13.436	cents
Barton, Duer & Koch	13.75	cents

No. 173—16,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow. No. 88; flat, cut 21x32½ ins. Min. order, one color, 4,000 lbs.

Virginia Paper Co. Inc. (1 Year)	14.914	cents
R. P. Andrews Paper Co. (6 Months)	12.77	cents
Stanford Paper Co.	15.07	cents
American Writing Paper Co.	14.84	cents
The Old Dominion Paper Co.	13.436	cents
Barton, Duer & Koch	13.75	cents

100 Per Cent Rag White Ledger, Tub-Sized, Air-Dried
Air-Dried

No. 176—15,000 lbs., No. 48; flat, cut 21x32, 22¾x31½, 22x36, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Carew Manufacturing Co., South Hadley Falls, Mass. (1 Year) (d)	16.49	cents
Marquette Paper Co. (f)	18.88	cents
Hawthorn Paper Co. (h)	18.09	cents
Whiting Paper Co. (1 Year) (i)	20.0	cents
R. P. Andrews Paper Co. (1 Year) (n)	19.14	cents
American Writing Paper Co. (r)	18.48	cents
The Old Dominion Paper Co. (t)	17.714	cents
Barton, Duer & Koch (y)	20.25	cents
The Whitaker Paper Co. (aa)	19.48	cents

No. 177—50,000 lbs., No. 56; flat, cut 20x28, 21x32, 23x36, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Carew Manufacturing Co. (1 Year) (d)	16.49	cents
Marquette Paper Co. (f)	18.88	cents
Hawthorn Paper Co. (h)	18.09	cents
Whiting Paper Co. (i)	20.0	cents
R. P. Andrews Paper Co. (1 Year) (n)	19.14	cents
American Writing Paper Co. (r)	18.48	cents
The Old Dominion Paper Co. (t)	17.714	cents
Barton, Duer & Koch (y)	20.25	cents
The Whitaker Paper Co. (aa)	19.48	cents

No. 178—25,000 lbs., No. 64; flat, cut 18½x42, 21x32, 23x36 and 28x34 ins. Min. order 5,000 lbs.

Carew Manufacturing Co. (1 Year) (d)	16.49	cents
Marquette Paper Co. (f)	18.88	cents
Hawthorn Paper Co. (h)	18.09	cents
Whiting Paper Co. (1 Year) (i)	20.0	cents
R. P. Andrews Paper Co. (1 Year) (n)	19.14	cents
American Writing Paper Co. (r)	18.48	cents
The Old Dominion Paper Co. (T)	17.714	cents
Barton, Duer & Koch. (Y)	20.25	cents
The Whitaker Paper Co. (aa)	19.48	cents

No. 179—15,000 lbs., No. 72; flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Carew Manufacturing Co. (1 Year) (d)	16.49	cents
Marquette Paper Co. (f)	18.88	cents
Hawthorn Paper Co. (h)	18.09	cents
Whiting Paper Co. (1Year) (i)	20.0	cents
R. P. Andrews Paper Co. (1 Year) (n)	19.14	cents
American Writing Paper Co. (r)	18.48	cents
The Old Dominion Paper Co. (t)	17.714	cents
Barton, Duer & Koch (y)	20.25	cents
The Whitaker Paper Co. (aa)	19.48	cents

No. 180—8,000 lbs., No. 80; flat, cut 21x32½ and 21x42 ins. Min. order 4,000 lbs.

Carew Manufacturing Co. (1 Year) (d)	16.49	cents
Marquette Paper Co. (f)	18.88	cents
Hawthorn Paper Co. (h)	18.34	cents
Whiting Paper Co. (1 Year) (i)	20.0	cents
R. P. Andrews Paper Co. (1 Year) (n)	19.14	cents
American Writing Paper Co. (r)	19.48	cents
The Old Dominion Paper Co. (T)	17.714	cents
Barton, Duer & Koch (y)	20.25	cents
The Whitaker Paper Co. (aa)	18.48	cents
Dobler & Mudge (ab)	18.89	cents

No. 181—35,000 lbs., No. 88; flat, cut 20½ x24¾, 21x32½, and 22¾x31½ ins. Min. order 5,000 lbs.

Carew Manufacturing Co. (1 Year) (d)	16.49	cents
Marquette Paper Co. (f)	18.88	cents
Whiting Paper Co. (1 Year) (i)	20.0	cents
R. P. Andrews Paper Co. (1 Year) (n)	19.14	cents
American Writing Paper Co. (r)	18.98	cents
The Old Dominion Paper Co. (t)	17.714	cents
Barton, Duer & Koch. (y)	20.25	cents
The Whitaker Paper Co. (aa)	19.48	cents
Dobler & Mudge (ab)	18.89	cents

Sulphite Index, White and Colored, Single-Ply

No. 184—90,000 lbs., white, 22½x28½—182 and 230; flat, cut 21x32½, 22½x28½, and 24½x32½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Cawthorne Paper Co.	6.03	cents
Virginia Paper Co., Inc. (1 Year)	5.40	cents
R. P. Andrews Paper Co.	5.68	cents
Stanford Paper Co.	5.97	cents
Perkins-Goodwin Co. (1 Year)	6.26	cents
The Old Dominion Paper Co. (C.L.)	5.39	cents
(L.C.L.)	5.549	cents
The Aetna Paper Co.	5.17	cents
Barton, Duer & Koch.	5.48	cents
Dobler & Mudge	5.74	cents

No. 185—5,000 lbs., white, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 2,500 lbs.

Cawthorne Paper Co. Inc.	6.96	cents
Perkins-Goodwin Co. (1 Year)	7.14	cents
The Old Dominion Paper Co.	5.799	cents

No. 186—6,000 lbs., blue, buff, fawn, green, pink, salmon, and yellow, 22½x28½—182 and 230; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 2,000 lbs.

R. P. Andrews Paper Co.	6.75	cents
The Aetna Paper Co.	9.97	cents

No. 187—6,000 lbs., blue, buff, fawn, green, pink, salmon, and yellow, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 2,000 lbs.

The Aetna Paper Co.	9.97	cents

50 Per Cent Rag Index, White and Colored, Single-Ply

No. 190—120,000 lbs., white, 22½x28½—182 and 230; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 5,000 lbs.

Marquette Paper Co.		9.80	cents
Virginia Paper Co., Inc.	(1 Year)	11.722	cents
R. P. Andrews Paper Co.	(1 Year)	11.49	cents
American Writing Paper Co.		11.62	cents
The Old Dominion Paper Co.		11.899	cents
The Aetna Paper Co.		9.97	cents
Barton, Duer & Koch		11.15	cents

No. 191—15,000 lbs., white, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-marker between each 100 sheets. Min. order, one weight, 5,000 lbs.

Virginia Paper Co., Inc.	(1 Year)	11.722	cents
Barton, Duer & Koch		13.59	cents

No. 192—70,000 lbs., blue, buff, fawn, green, pink, salmon, and yellow, 22½x28½—182 and 230; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Virginia Paper Co., Inc.	(1 Year)	12.677	cents
American Writing Paper Co.		12.62	cents
The Old Dominion Paper Co.		12.939	cents
The Aetna Paper Co.		10.97	cents
Barton, Duer & Koch		12.37	cents

No. 193—25,000 lbs., blue, buff, fawn, green, pink, salmon, and yellow, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Virginia Paper Co., Inc.	(1 Year)	12.677	cents
Barton, Duer & Koch		14.79	cents

100 Per Cent Rag White Index, Single Ply, Tub-Sized, Air-Dried

No. 196—170,000 lbs., 22½x28¼—approximately 206; flat, cut 20½x30½ and 21x32½ ins.

Carew Manufacturing Co.	(1 Year)	15.74	cents
Marquette Paper Co.	(f)	17.98	cents
Virginia Paper Co., Inc.	(1 Year)	18.89	cents
R. P. Andrews Paper Co.	(1 Year)	17.47	cents
American Writing Paper Co.		16.81	cents
The Old Dominion Paper Co.		17.123	cents
Barton, Duer & Koch		17.75	cents

White Tissue

No. 197—5,000 lbs., flat, 21x32—18. Min. order 1,000 lbs.

R. P. Andrews Paper Co.	(6 Months)	8.97	cents
Mathers-Lamm Paper Co., Washington, D. C.		9.975	cents
Old Dominion Paper Co.		9.49	cents
Reese and Reese, Inc.	(6 Months)	9.39	cents
Lindemyer Paper Co.	(6 Months)	9.57	cents
Barton, Duer & Koch		9.75	cents

Facing Stereo Tissue

No. 198—1,000 lbs., 19x24—9; rolls 24 ins. wide (3-inch iron cores). Min. order 500 lbs.

Cawthorne Paper Co., Inc.		67.94	cents
The Old Dominion Paper Co	(u)	64.98	cents

Coated Cover, Colored

No. 201—200,000 lbs., India tint, light green, light gray and primrose, flat, 26½x41—208.

Bryant Paper Co.	(6 Months)	5.92	cents
	(1 Year)	6.81	cents
R. P. Andrews Paper Co.	(1 Year)	6.38	cents
Perkins-Goodwin Co.	(1 Year)	5.815	cents
Reese and Reese Inc.	(6 Months)	7.49	cents
	(1 Year)	7.99	cents
The Whitaker Paper Co.		5.888	cents

25 Per Cent Rag Machine-Finish Cover, Colored

No. 203—30,000 lbs., quaker drab, robin's egg, and terra cotta, flat, 20x24—96; in wrapped bundles with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,500 lbs.

Knowlton Brothers, Watertown, N. Y.	(1 Year)	6.08	cents
R. P. Andrews Paper Co.	(1 Year)	6.87	cents
American Writing Paper Co.		6.48	cents

No. 204—140,000 lbs., blue, brown, granite, green, pink, tea and yellow, 20x26—100; flat, cut 20x25 and 33x46 ins., in wrapped bundles, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

Knowlton Brothers	(1 Year)	5.88	cents
R. P. Andrews Paper Co.	(1 Year)	6.64	cents
American Writing Paper Co.		6.28	cents
The Aetna Paper Co.		5.67	cents
The Whitaker Paper Co.		6.0	cents

50 Per Cent Rag Laid Cover, Colored

No. 205—18,000 lbs., (manufacturer's stock shades as selected), blue, buff, cream white, gray, green and terra cotta, 20x26—130. flat, cut 20x25, 26½x41 ins., in wrapped bundles, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	10.35	cents

50 Per Cent Rag Antique Cover, Colored

No. 206—80,000 lbs., drawn, gobelin-blue, khaki, moss-green, sage and suede; flat, cut 20x25 ins., in wrapped bundles with projecting colored paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

Knowlton Brothers	(1 Year)	7.08	cents
R. P. Andrews Paper Co.	(1 Year)	7.67	cents
American Writing Paper Co.		7.39	cents
The Old Dominion Paper Co.	(v)	6.949	cents
The Aetna Paper Co.		6.67	cents

Wood Manila

No. 209—200,000 lbs., 24x36—60 to 120; flat, cut 21x32, 22½x34½, and 25x38 ins., in wrapped bundles, with projecting colored-paper marker between each 500 sheets.

Thomas J. McCormick Paper Corp.		3.19	cents
R. P. Andrews Paper Co.	(1 Year)	2.96	cents
Perkins-Goodwin Co.	(1 Year)	2.895	cents
The Old Dominion Paper Co.	(v)	3.529	cents
Reese and Reese, Inc.		3.15	cents

No. 210—550,000 lbs., 24x36—60 to 120; rolls, 9, 11½, 18, and 21 ins. wide (3-inch iron cores; except the 9 and 11½ inch rolls, which shall be found on wooden plugs, 1½-inch hole).

Thomas J. McCormick Paper Corp.		2.94	cents
R. P. Andrews Paper Co.	(1 Year)	2.775	cents
Perkins-Goodwin Co.	(1 Year)	2.737	cents
The Old Dominion Paper Co.		3.278	cents
Reese and Reese Inc.		2.90	cents

Sulphite Manila

No. 211—50,000 lbs., 24x36—100 to 160; flat, cut any size, in wrapped bundles of 500 sheets each. Min. order, one weight, 10,000 lbs.

Thomas J. McCormick Paper Corp.		4.84	cents
Cawthorne Paper Company, Inc.		4.73	cents
Virginia Paper Company, Inc.	(1 Year)	3.85	cents
Perkins-Goodwin Co.	(1 Year)	5.34	cents
The Old Dominion Paper Co.		5.438	cents
Barton, Duer & Koch		5.0	cents

No. 212—80,000 lbs., 24x36—160; rolls, 18 ins. wide (3-inch iron cores).

Thomas J. McCormick Paper Corp.		4.59	cents
Cawthorne Paper Company, Inc.		4.47	cents
Virginia Paper Company, Inc.	(1 Year)	3.85	cents
Perkins-Goodwin Co.		5.24	cents
The Old Dominion Paper Co.	(C.L.)	5.899	cents
	(L.C.L.)	5.339	cents
Barton, Duer & Koch		4.85	cents
The Whitaker Paper Co.		5.0	cents

Rope Manila

No. 213—30,000 lbs., 24x36—120, 140 and 160; rolls, 48 ins. wide (3-inch iron cores). Min. order 10,000 lbs.

Reese and Reese, Inc.		11.50	cents

No. 214—45,000 lbs., 24x36—280; rolls 48 ins. wide (3-inch iron cores). Min. order 15,000 lbs.

Reese and Reese Inc.		10.35	cents

No. 2 Kraft

No. 217—300,000 lbs., 24x36—60 to 160; flat, cut any size, in wrapped bundles of 500 sheets each.

Walker, Goulard, Plehn Company, Inc.		3.50	cents
R. P. Andrews Paper Co.		3.30	cents
Coy Hunt & Company, New York City		3.54	cents
Perkins-Goodwin Co.		3.789	cents
Barton, Duer & Koch		3.44	cents
The Whitaker Paper Co.		3.50	cents
W. L. Jones, Inc.	(6 Months)	3.50	cents

No. 218—450,000 lbs., 24x36—60 to 160; cut any size, folded (25 sheets per fold), in wrapped bundles of 500 sheets each.

Walker, Goulard, Plehn Co., Inc.		3.50	cents
R. P. Andrews Paper Co.		3.30	cents
Coy, Hunt & Co.		3.54	cents
Perkins-Goodwin Co.		3.788	cents
Barton, Duer & Koch		3.44	cents
The Whitaker Paper Co.		3.50	cents
W. L. Jones, Inc.	(6 Months)	3.50	cents

No. 219—250,000 lbs., 24x36—60 to 160; rolls, 11½. 24, 36, 39, and 48 ins. wide, wound on wooden plugs, 1½-inch hole, or on 3-inch iron cores as may be specified.

Walker, Goulard, Plehn Co.		3.25	cents
R. P. Andrews Paper Co.		3.05	cents
Coy, Hunt and Co.		3.39	cents
Perkins-Goodwin Co.		3.284	cents
Barton, Duer & Koch		3.20	cents
The Whitaker Paper Co.		3.25	cents
W. L. Jones, Inc.	(6 Months)	3.25	cents

No. 1 Kraft

No. 220—20,000 lbs., 24x36—120 and 160. flat, cut any size, in wrapped bundles of 500 sheets each.

R. P. Andrews Paper Co.	(1 Year)	4.70	cents
Perkins-Goodwin Co.		4.389	cents
The Whitaker Paper Co.		4.40	cents

High-Finish Sulphite Manila Tag

No. 221—200,000 lbs., 24x36—160 to 280; flat, cut any size min. width 24 ins., max. width 38 ins., in wrapped bundles of 500 sheets.

Virginia Paper Co., Inc.	(1 Year)	5.02	cents
Perkins-Goodwin Co.	(1 Year)	5.35	cents
The Old Dominion Paper Co.		4.898	cents
Reese and Reese Inc.		5.30	cents
The Aetna Paper Co.		4.67	cents
Barton, Duer & Koch		5.23	cents
The Whitaker Paper Co.		5.25	cents

Calendered Tag, Manila and Colored

No. 224—600,000 lbs., 22½x28½—Approximately 148; rolls, 23¼ and 26½ ins. wide (6-in iron cores).

R. P. Andrews Paper Co.	(1 Year)	6.28	cents
The Old Dominion Paper Co.		5.149	cents
Barton, Duer & Koch		6.75	cents

No. 225—150,000 lbs., blue, brown, green, pink, red, salmon and yellow, 22½x28½—approximately 148; rolls 23¼ and 26½ ins. wide (6-inch iron cores). Min. order, one color, 5,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	7.05	cents
The Old Dominion Paper Co.		6.499	cents
Barton, Duer & Koch		7.50	cents

Jute Tag

No. 227—120,000 lbs., 22½x28½—200 to 280; flat, cut 22½x28½ ins., in wrapped bundles of 500 sheets each. Min. order, one weight, 5,000 lbs.

Reese and Reese, Inc.		6.93	cents
The Whitaker Paper Co.		6.75	cents

Manila Board

No. 301—80,000 lbs., 22½x28½—400; flat, cut 17x28, 21x32, and 22½x28½ ins., in wrapped bundles of 500 sheets each, with projecting colored-paper marker between each 100 sheets. Min. order 10,000 lbs.

Cawthorne Paper Co., Inc.		4.22	cents
Virginia Paper Co., Inc.	(1 Year)	4.56	cents
R. P. Andrews Paper Co.	(1 Year)	3.65	cents
The Old Dominion Paper Co.		4.599	cents
Barton, Duer & Koch		4.60	cents
The Whitaker Paper Co.		4.63	cents

Railroad Board, White and Colored

No. 302—90,000 sheets, white, flat, 22x28 ins., 4 ply, each 100 sheets fully banded, packed in wooden cases. Min. order 5,000 sheets.

N. N. Elish & Co., Inc., New York City		$21.525
Virginian Paper Co.	(1 Year)	$22.32
R. P. Andrews Paper Co.	(1 Year)	$23.13
Stanford Paper Co.		$23.00
Reese and Reese, Inc.		$23.95
Barton, Duer & Koch		$20.79
The Whitaker Paper Co.		$22.37
Dobler & Mudge		$23.57

No. 303—20,000 sheets, white, flat, 22x28 ins., 8 ply, each 100 sheets fully banded, packed in wooden cases. Min. order 5,000 sheets.

M. M. Elish & Co., Inc.		$31.87
Virginia Paper Co., Inc.	(1 Year)	$32.91
R. P. Andrews Paper Co.	(1 Year)	$34.23
Stanford Paper Co.		$33.50
Reese and Reese, Inc.		$36.00
Barton, Duer & Koch		$33.21
The Whitaker Paper Co.		$33.05
Dobler & Mudge		$34.75

No. 304—20,000 sheets, white, flat, 22x28 ins., 14 ply, each 50 sheets fully banded, packed in wooden cases. Min. order 5,000 sheets.

M. M. Elish & Co., Inc.		$49.245
Virginia Paper Co., Inc.	(1 Year)	$51.20
R. P. Andrews Paper Co.	(1 Year)	$52.96
Stanford Paper Co.		$52.00
Reese and Reese, Inc.		$50.95
Barton, Duer & Koch		$51.57
The Whitaker Paper Co.		$51.25
Dobler & Mudge		$54.10

No. 305—150,000 sheets, ash gray, blue, buff, green, lemon and orange, flat, 22x28 ins., 4 ply, each 100 sheets fully banded, packed in wooden cases. Min. order, one color, 5,000 sheets.

M. M. Elish & Co., Inc.		$22.995
Virginia Paper Co., Inc.	(1 Year)	$24.86
R. P. Andrews Paper Co.	(1 Year)	$25.99
Stanford Paper Co.		$26.50
Reese and Reese, Inc.		$24.95
Barton, Duer & Koch		$23.67
The Whitaker Paper Co.		$28.75
Dobler & Mudge		$26.25

Wood Bristol, Colored

No. 306—80,000 lbs., buff, 22½x28½—150; rolls 20 and 22 ins. wide (6-inch iron cores).

Thomas J. McCormick Paper Corp.		3.59	cents
R. P. Andrews Paper Co.	(1 Year)	3.89	cents
Perkins-Goodwin Co.	(1 Year)	3.915	cents
The Old Dominion Paper Co.		3.747	cents
Reese and Reese, Inc.		4.33	cents
Barton, Duer & Koch		4.41	cents
The Whitaker Paper Co.		4.34	cents

No. 307—200,000 lbs., blue, buff, gray, green, melon, pink, quaker-drab, and yellow, flat, 21x31—204; in wrapped bundles of 500 sheets each, with projecting colored-paper marker between each 100 sheets.

Thomas J. McCormick Paper Corp.		3.59	cents
R. P. Andrews Paper Co.	(1 Year)	3.89	cents
Perkins-Goodwin Co.	(1 Year)	3.915	cents
The Old Dominion Paper Co.		3.747	cents
Reese and Reese Inc.		4.33	cents
Barton, Duer & Koch		4.41	cents
The Whitaker Paper Co.		3.43	cents

No. 308—300,000 lbs., blue, brown, buff, gray, green, melon, pink, and yellow, 22½x28½—200; rolls 20 ins. wide (6-inch iron cores.)

Thomas J. McCormick Paper Corp.		3.59	cents
R. P. Andrews Paper Co.	(1 Year)	3.89	cents
Perkins-Goodwin Co.		3.915	cents
The Old Dominion Paper Co.		3.747	cents
Reese and Reese Inc.		4.33	cents
Barton, Duer & Koch		4.41	cents
The Whitaker Paper Co.		3.43	cents

No. 309—300,000 lbs., blue, brown, buff, gray, green, melon, pink and yellow, 22½x28½—200; rolls 20 ins. wide (6-inch iron cores.)

Thomas J. McCormick Paper Corp.		3.59	cents
R. P. Andrews Paper Co.	(1 Year)	3.89	cents
Perkins-Goodwin Co.	(1 Year)	3.915	cents
The Old Dominion Paper Co.		3.747	cents
Reese and Reese, Inc.		4.33	cents
Barton, Duer & Koch		4.41	cents
The Whitaker Paper Co.		3.43	cents

No. 310—100,000 lbs., buff, 22½x28½—200; flat, cut 12x18 and 14½x17½ ins., the grain to run lengthwise of the sheet, in wrapped bundles of 500 sheets each.

Thomas J. McCormick Paper Corp.		3.59	cents
R. P. Andrews Paper Co.	(1 Year)	3.89	cents
Perkins-Goodwin Co.	(1 Year)	3.915	cents
The Old Dominion Paper Co.		3.747	cents
Reese and Reese, Inc.		4.33	cents
Barton, Duer & Koch		4.41	cents
The Whitaker Paper Co.		3.43	cents

U. S. Postal Card Bristol

No. 311—10,000,000 lbs., 22½x28½—188; rolls 33 ins. wide and 34 ins. in diameter (6-inch iron cores).

Note.—Approximately 50,000 lbs. of 24½-inch rolls may be ordered.

International Paper Co., New York City		3.73	cents
Virginia Paper Co., Inc.	(1 Year)	3.544	cents
For 1,000,000 Lbs.		3.90	cents
For 1,000,000 Lbs.		4.00	cents
R. P. Andrews Paper Co.		3.47	cents
The Whitaker Paper Co.		3.337	cents

White Paraffin

No. 351—6,000 lbs., flat, 24x38—32. Min. order 1,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	11.0	cents
Mathers-Lamm Paper Co.	(6 Months)	9.52	cents
Perkins-Goodwin Co.	(1 Year)	11.87	cents
The Whitaker Paper Co.		9.72	cents

White Gummed

No. 352—200,000 sheets, flat 17x22—40, exclusive of weight of gum used. Min. order 50,000 sheets.

The Brown-Bridge Mills Inc., Troy, Ohio.	(6 Months)	$5.55
	(1 Year)	$5.52
M. M. Elish & Co., Inc.		$5.46
Cawthorne Paper Co.		$4.96
Virginia Paper Co., Inc.	(1 Year)	$5.53
R. P. Andrews Paper Co.	(1 Year)	$5.50
Paper Manufacturers Co., Corp., Philadelphia, Pa.		$6.00
Perkins-Goodwin Co.	(1 Year)	$5.545
The Old Dominion Paper Co.		$5.53
Barton, Duer & Koch		$5.60
The Whitaker Paper Co.		$5.50
Dobler and Mudge		$5.85

No. 353—10,000 sheets, flat, 20x25—54, exclusive of weight of gum used. Min. order 5,000 sheets.

The Brown Bridge Mills Inc.	(1 Year)	$7.40
	(6 Months)	$7.36
M. M. Elish & Co., Inc.		$7.297
Virginia Paper Co., Inc.	(1 Year)	$7.40
R. P. Andrews Paper Co.		$7.38
Paper Manufacturers Co., Inc.		$8.00
Perkins-Goodwin Co.		$7.46
The Old Dominion Paper Co.		$7.49
Barton, Duer & Koch		$7.50
The Whitaker Paper Co.		$7.40
Dobler & Mudge		$7.85
Cawthorne Paper Co.		$6.76

Blotting, White and Colored

No. 354—16,000 lbs., white, flat, 19x24—160, in wrapped bundles of 250 or 500 sheets. Min. order 4,000 lbs.

R. P. Andrews Paper Co.		5.29	cents
The Old Dominion Paper Co.		5.239	cents
Lindemyer Paper Co.		5.81	cents
Barton, Duer & Koch		5.0	cents
The Whitaker Paper Co.		4.92	cents

No. 355—8,000 lbs., (manufacturer's stock shade), buff and salmon, flat, 19x24—160; in wrapped bundles of 250 or 500 sheets. Min. order 4,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	5.29	cents
The Old Dominion Paper Co.		5.239	cents
Lindemyer Paper Co.		5.91	cents
Barton, Duer & Koch		5.0	cents
The Whitaker Paper Co.		4.92	cents

25 Per Cent Rag Blotting, White and Colored

No. 356—40,000 lbs., white, flat, 19x24—160 ins.; in wrapped bundles of 250 or 500 sheets. Min. order 10,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	6.29	cents
The Old Dominion Paper Co.		6.238	cents
Lindemyer Paper Co.		6.50	cents
Barton, Duer & Koch		6.0	cents
The Whitaker Paper Co.		5.83	cents
Dobler & Mudge		6.10	cents

No. 357—12,000 lbs., (manufacturer's stock shade), buff and salmon, flat, 19x24—160; in wrapped bundles of 250 or 500 sheets. Min. order, one color, 4,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	6.29	cents
The Old Dominion Paper Co.		6.238	cents
Lindemyer Paper Co.		6.80	cents
Barton, Duer & Koch		6.0	cents
The Whitaker Paper Co.		5.83	cents

Desk Blotting, Colored

No. 358—50,000 lbs., (manufacturer's stock shade), blue and buff, flat, 19x24—200; in wrapped bundles of 250 or 500 sheets. Min. order, one color, 5,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	5.0	cents
The Old Dominion Paper Co.		5.239	cents
Lindemyer Paper Co.	(BLUE)	6.25	cents
	(BUFF)	5.80	cents
Barton, Duer & Koch		5.0	cents
The Whitaker Paper Co.		4.92	cents
Dobler & Mudge		5.25	cents

No. 359—125,000 lbs., moss-green (manufacturer's stock shade flat, 19x24—200; in wrapped bundles of 250 or 500 sheets. Min. order 10,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	5.09	cents
The Old Dominion Paper Co.		5.574	cents
Barton, Duer & Koch		5.525	cents
The Whitaker Paper Co.		5.23	cents
Dobler & Mudge		5.49	cents

White Stereotype Molding

No. 360—4,000 lbs., 19x24—120; rolls, 24 ins. wide (3-inch iron cores). Min. order 1,000 lbs.

Cawthorne Paper Co., Inc.		8.44	cents
The Old Dominion Paper Co.		9.31	cents
Barton, Duer & Koch		9.0	cents

Red Stereotype Molding

No. 361—3,000 lbs., 19x24—80; rolls, 24 ins. wide (3-inch iron cores). Min. order 1,000 lbs.

Cawthorne Paper Co., Inc.		10.42	cents
The Old Dominion Paper Co.		11.39	cents
Barton, Duer & Koch		9.50	cents

Oiled Manila Tympan

No. 362—35,000 lbs., 24x36—approximately 200; rolls, 38 and 48 ins. wide; max. weight 150 lbs.; wound on wooden plugs, 1½-inch hole. Min. order 5,000 lbs.

Link Paper Co., New York City	(1 Year) (c)	6.35	cents
R. P. Andrews Paper Co.	(1 Year)	8.0	cents
Mathers-Lamm Paper Co.		7.78	cents
The Old Dominion Paper Co.		7.59	cents
Reese and Reese, Inc.		6.80	cents
Barton, Duer & Koch		8.0	cents
The Whitaker Paper Co.		7.935	cents

Plate Wiping, For Embossing Presses

No. 363—3,000 lbs., 24x36—100; rolls, 24 ins. wide (3-inch iron cores). Min. order 1,000 lbs.

Link Paper Co.	(1 Year)	6.85	cents
R. P. Andrews Paper Co.	(1 Year)	6.69	cents
Barton, Duer & Koch		7.0	cents

Back Lining, For Case-Making Machines

No. 364—4,000 lbs., 24x36—180; rolls, 12 ins. diameter, 24 ins. wide, wound on wooden plugs, 1 or 1½-inch hole. Min. order 2,000 lbs.

R. P. Andrews Paper Co.	(1 Year)	3.53	cents
Mathers-Lamm Paper Co.	(1 Year)	3.44	cents
Lindemyer Paper Co.		3.65	cents
Barton, Duer & Koch		3.65	cents
The Whitaker Paper Co.		3.47	cents

High Finish Red Sulphite

No. 365—30,000 lbs., flat, 24x36—320 and 400; in wrapped bundles of 250 sheets. Min. order 5,000 lbs.

Virginia Paper Co., Inc.	(1 year) (1)	5.83	cents
R. P. Andrews Paper Co.	(1 Year)	6.44	cents
Perkins-Goodwin Co.	(1 Year)	5.378	cents
The Old Dominion Paper Co.		6.424	cents
Reese and Reese, Inc.		6.25	cents
Barton, Duer & Koch		6.23	cents
The Whitaker Paper Co.		6.0	cents

Pressboard, Colored

No. 366—30,000 sheets, red, flat, 24x32 ins., thickness .0140 inch. Min. order 5,000 sheets.

Walker, Goulard, Phlehn Co.	$5.20	per 100 sheets
R. P. Andrews Paper Co.	(1 Year) $5.21	per 100 sheets
Mathers-Lamm Paper Co.	$5.26¼	per 100 sheets
The Old Dominion Paper Co.	10.74	per pound
Reese and Reese, Inc.	$5.33	per 100 sheets
Lindemyer Paper Co.	$5.99	per 100 sheets
Barton, Duer & Koch	$5.25	per 100 sheets
The Whitaker Paper Co.	$5.21	per 100 sheets

No. 367—20,000 sheets, gray, flat, 30x36 ins., thickness .0300 inch. Min. order 5,000 sheets.

Walker, Goulard, Phlehn Co.	$16.40	
R. P. Andrews Paper Co.	(1 Year) $16.74	
Mathers-Lamm Paper Co.	(1 Year) $16.944	
The Old Dominion Paper Co.	11.34	per pound
Reese and Reese, Inc.	$17.15	
Lindemyer Paper Co.	$18.81	
Barton, Duer & Koch	$16.93	
The Whitaker Paper Co.	$16.69	

News Board

No. 401—3,000 lbs., flat, 26x38 ins., No. 100. (To be trimmed square on four sides). Min. order 1,000 lbs.

Walker, Goular, Phlehn Co.	(6 Months)	1.25	cents
Rogers Printing Company, Baltimore, Md.			
	(1—6 Months)	1.125	cents
	(2—6 Months)	1.25	cents
Virginia Paper Co., Inc.	(1 Year)	1.231	cents
R. P. Andrews Paper Co.	(1 Year)	1.25	cents
Mathers-Lamm Paper Co.		1.25	cents
The Old Dominion Paper Co.		1.43	cents
Lindemyer Paper Co.		1.250	cents
Barton, Duer & Koch		1.25	cents
The Whitaker Paper Co.		1.26	cents

Chip Board

No. 402—800,000 lbs., 26x38 ins., No. 50; flat, cut 21½x32½, 24½x38, 26x38, 28½x34½, and 32½x42½ ins.

Walker, Goulard, Plehn Co.		1.6585	cents
Cawthorne Paper Co., Inc.		1.2444	cents
Rogers Printing Co.	(1st 6 Months)	1.125	cents
	(last 6 Months)	1.25	cents
The La Boiteaux Co., Norwood, Cincinnati, Ohio(j)		1.237	cents
Virginia Paper Co., Inc.	(1 Year)	1.231	cents
R. P. Andrews Paper Co.	(1 Year)	1.232	cents
Mathers-Lamm Paper Co.		1.224	cents
The Old Dominion Paper Co.	(6 Months)	1.172	cents
	(1 Year)	1.234	cents
Reese and Reese, Inc.	(6 Months)	1.15	cents
	(1 Year)	1.25	cents
Lindemyer Paper Co.		1.236	cents
Barton, Duer & Koch		1.24	cents
The Whitaker Paper Co.		1.218	cents

Marble Grained Lined Board

No. 403—36,000 lbs., 26x38 ins., No. 50; flat, cut 22x32 ins.

The Old Dominion Paper Co.	(6 Months)	3.599	cents
	(1 year)	3.473	cents
The Whitaker Paper Co.		3.695	cents

Straw Board

No. 404—40,000 lbs., flat, 26x38 ins., No. 50.

Walker, Goulard, Plehn Co.		2.0	cents
Mathers-Lamm Paper Co.	(6 Months)	2.025	cents

Lined Straw Board

No. 405—10,000 lbs., flat, 26x38 ins., No. 50.

(No Bidders.)*

Lined Box Board

No. 406—72,000 lbs., 26x38 ins., No. 40; flat, cut 24½x34 ins. Min. order 36,000 lbs.

Walker, Goulard, Plehn Co.		1.6585	cents
Rogers Printing Co.	(1st 6 Months)	1.685	cents
	(last 6 Months)	1.81	cents
The La Boiteaux Co.	(j)	1.712	cents
Virginia Paper Co., Inc.	(1 Year)	1.649	cents
R. P. Andrews Paper Co.	(1 Year)	1.649	cents
Mathers-Lamm Paper Co.	(1 Year)	1.641	cents
The Old Dominion Paper Co.		1.698	cents
Reese and Reese, Inc.	(6 Months)	1.75	cents
	(1 Year)	1.85	cents
Lindemyer Paper Co.		1.673	cents
Barton, Duer & Koch		1.67	cents
The Whitaker Paper Co.		1.64	cents

Solid Binders Board, No. 2 Quality

No. 407—700,000 lbs., hard rolled, flat, to trim 25x30 ins., Nos. 16, 18, 20, 25, 30 and 40.

Note.—Approximately 80,000 lbs. may be ordered cut 34x44 ins.

Consolidated Paper Co., Monroe, Mich.			
	(6 Months) (b)	.0305	cents
		$61.00	per ton
	(1 Year)	3 cents	Net
R. P. Andrews Paper Co.	(6 Months)	2.838	cents
	(1 Year)	2.788	cents
Mathers-Lamm Paper Co.	(6 Months)	2.9375	cents
	(1 Year)	2.8475	cents
The Old Dominion Paper Co.		3.0	cents
Barton, Duer & Koch		2.975	cents
The Whitaker Paper Co.	(6 Months)	2.91	cents
	(1 Year)	2.86	cents

Solid Binders Board, No. 1 Quality

No. 408—100,000 lbs., hard rolled, flat, to trim 20x30 ins., and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40, and 45.

Consolidated Paper Co.		.042	cents
		$84.00	per ton
R. P. Andrews Paper Co.	(1 Year)	4.25	cents
Barton, Duer & Koch		4.10	cents

REFERENCES

a—100% New Rag should cuttings, muslin linens or No. 1.
b—If in less than carload lots add $6 per ton.
c—"On our sample".
d—Unbleached muslin, unbleached and cream hosiery.
e—All new rag, white, cream or unbleached.
f—All new rag, white, cream or unbleached.
g—New white, flannelite cuttings.
h—New white rags.
i—New white rags.
j—"F.O.B. your sidewalk."
k—Shipments to be made in approximately monthly quantities.
l—2000 lbs. per month.
m—New white cuttings.
n—New unbleached cotton.
o—plus 49 cents per 100 lbs. for L.C.L. shipments.
p—Unbleached No. 1 muslin goods and No. 1 new white shirt cuttings.
q—White shirt cuttings.
r—100 per cent new rags and muslins.
s—Maximum size 36 by 52 inches.
t—New factory cuttings.
u—24½ inch rolls, 3 inch fibre cores.
v—Khaki shade only.
w—New white rags.
x—No. 1 new white shirtings with new glove cuttings.
y—Unbleached muslin and canton flannel.
z—White shirt cuttings.
aa—100 per cent new white cuttings.
ab—No. 1 new unbleached muslin cuttings and No. 1 white shirting cutting blended.

C. L. Sheldon Goes With Northwest Paper Co.

I. L. Gartland, general sales manager of the Northwest Paper Company, with mills at Brainerd and at Cloquet, Minn., announces the appointment of Clarence P. Sheldon as district sales manager in charge of fine printing papers as well as converting paper sales for the Pacific Coast. His headquarters will be in San Francisco with offices at 149 California street.

Mr. Sheldon has had considerable experience with the paper jobbers, being formerly connected with Bradner Smith & Whitaker Paper Company, both of Chicago. He has also spent considerable time at the mill and is thoroughly posted on the mill's ability to produce various specialty papers. This should be helpful in solving the various problems of the jobbers.

The Northwest Paper Company is affiliated with the Weyerhaeuser interests. The general sales office is at Cloquet, Minn. and the daily capacity of the mill is 1,000,000 pounds of pulp and paper. All paper is made from virgin pulp. The grades manufactured are English Finish, Eggshell, Super, Label, Offset, Writing, Bond, Index, Postcard, Ledger, Tub Sized Specialties Vellum, Publication Book, Bulking Book Drawing, Antique Envelope, White Envelope, Manila Envelope, Kraft Envelope, Nortex Envelope, Kraft Wrapping and Butchers Wrapping. Grade names such as Klo-Kay, Wilson, Northland, Arrowhead, Nortex and Japine are familiar to the trade.

Lee Paper Co. Has Good Year

KALAMAZOO, Mich., January 18, 1932—The Lee Paper Company was able to report a fairly good year during 1931, at the annual meeting of its stockholders and directors, held Friday afternoon in the offices of Harry C. Howard. The outlook for the next 12 months is not discouraging.

All officers and directors were re-elected as follows: Chairman of the board, Fred E. Lee, Dowagiac; president, general manager and treasurer, Norman Bardeen, Kalamazoo; first vice president, A. B. Gardner, Dowagiac; second vice president, John A. Howard, Kalamazoo; secretary, Byron Bishop, Vicksburg; directors, the officers and Mrs. Florence Anderson, Otsego, and George D. Cobb and Harry C. Howard, Kalamazoo.

George Pomeroy Goes Richwood

HARRISVILLE, N. Y., January 26, 1932—Announcement is made that George Pomeroy, formerly assistant superintendent at the Harrisville Paper Mills, has been appointed superintendent of Cherry River Paper Company, Richwood, W. Va., where he will make his home in the near future. He was brought to this village about a year ago when the superintendent of the local plant, Thomas Legge, became ill, to serve as an assistant. It was announced recently that the position had been abolished and Mr. Pomeroy lost no time in obtaining a job with the Southern concern.

Perkins-Goodwin Co. Increases Capital

The Perkins-Goodwin Company, of 551 Fifth Avenue, New York, has just increased its capital stock by $500,000, all paid in cash. This brings the total capitalization of the company up to $1,700,000, consisting of $1,000,000 preferred and $700,000 common stock. This increase was made to provide additional funds to take care of its expanding business, which during the last ten years, in spite of lower prices for both paper and pulp, has increased more than 300 per cent in dollar volume.

Ontario Paper Manufacturers Fairly Active

Fine Paper Mills Are Now Operating Close to Capacity—Book Paper Machines Are Busy Under Satisfactory Influx of Orders—Demand for Coated Stock Shows Improvement—Kraft Paper Industry Considered In Fairly Strong Position

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., January 25, 1932—Business in wholesale paper circles in Ontario is quietly settling back to more or less normal conditions following the holiday period and while orders of size are not being booked there is a steady run of paper turnover which seems to auger well for an early resumption of free buying by the consuming public. Few of the paper merchants have any complaints to offer about the volume of business they are doing and there is a distinctly optimistic spirit in the trade generally. The printing consumer has been buying a fair amount of fine paper during January so far and there is more work in the job line to be released within the next few weeks. Stocks in the hands of both printers and paper merchants were allowed to run down in some cases close to the vanishing point and replenishment is now in progress. This is not on a broad scale but it is sufficient to revive a healthy state of business and is looked upon as a sign of bigger business to come.

Most of the wholesalers report that fine papers are selling quite well for this time of year. In the coarse paper market light sales continue to prevail, but not to any greater extent than was expected with the quiet retail business being done following the holiday period, and which invariably exists. Paper bags are included in the light sale of coarse papers, although there is an increased demand for flour sacks, which are selling quite well. The light weight paper market is getting back to normal following the Christmas rush and the resultant period of light buying, and in this section, as in all others, the trade is looking for really good business as the spring months come on.

In the manufacturing department there is a fair degree of mill activity. Fine paper mills are operating close to capacity and few of them took advantage of the holiday season to close down. There is a fair call for practically all lines of fine paper and manufacturing operations are being carried on a satisfactory basis. There has been somewhat of a revival in demand for coated stock and book paper machines are busy under a satisfactory influx of orders. On the other hand, the paper converting trade finds business rather slow in developing. Wrapping paper machines are not operating on full schedule and few large orders for kraft paper are being placed. That industry, however, seems to be in a fairly strong position, although practically all of the business is confined to Eastern Canada, whereas there used to be a good market in the Canadian West for the product. Kraft mills in the West are now supplying the requirements of the western provinces. Eastern Canada mills are doing some export business, but it is of moderate extent. Box board mills are operating steadily and there was not the usual shutdown over the holiday season. Manufacturers of such lines as glassine, grease proof and waxing papers report business as rather dull.

Dryden Paper Outlook Fair

Though there was no sign of improvement in business at the present time, J. H. A. Acer, president, told the shareholders of Dryden Paper Company, with mills at Dryden, Ont., that he thought the company would be able to meet its bond interest as usual during the current year. This covers payment on an outstanding amount of $1,500,000 of bonds. Efforts are being made to create a broader market for paper flour bags, Mr. Acer said at the annual meeting, but these have been hampered by keener competition resulting from a sharp deflation in prices of cotton and jute. In addition to the business of manufacturing paper bags as cement containers, bags for holding flour were being sold to a mill at Midland, Ont., and were also tried out by the Western Canada Flour Mill at St. Boniface, Manitoba. Any improvement in the prices of jute and cotton, said Mr. Acer, would give Dryden an advantage.

Some attention was also being paid to the development of paper bags for holding sugar, for the use of refiners on the Pacific Coast. High freight rates however, tended to keep out eastern bag manufacturers.

Notes and Jottings of the Trade

The many friends of A. P. Costigane, secretary-engineer of the Ontario Pulp and Paper Makers' Safety Association, Toronto, were pleased to greet him again after a somewhat lengthy period of illness during which he was confined to his room.

C. E. French, of the Toronto office of the Howard Smith Paper Mills, was recently elected vice-president of the Toronto Flying Club. Mr. Smith is an enthusiastic flier and is the only Canadian airman among the paper forces to use his machine for calling on his customers outside Toronto.

Harcourt Powel, of the St. Maurice Valley Paper Company, Montreal, has been sent over to London, England, in the interests of the company, to assist W. G. Linehan while he is convalescing from his illness.

G. Boisvert, woods manager of the Ontario Paper Company, has returned to Thorold, Ont., after a business trip to Montreal.

J. H. Black, president of the Dominion Construction Company, and a former president of the Spruce Falls Pulp and Paper Company, has been elected president of the Toronto Board of Trade.

Regal Paper Co. Elects Officers

[FROM OUR REGULAR CORRESPONDENT]

PULASKI, N. Y., January 25, 1932.—The annual meeting of the stockholders of the Regal Paper Company, Inc., was held at the office of the company here last week. The following directors were elected for the ensuing year: Earle H. Benson, Edith D. Benson, Dimon W. Benson, Rhoda H. Benson, George D. Hull, Richard W. Sweet and Urban C. Herschey.

Following the meeting of the stockholders a meeting of the directors was held and the following officers elected: Earle H. Benson, president and general manager; Edith D. Benson, vice president; George D. Hull, vice president; Dimon W. Benson, secretary and treasurer, and George D. Hull, sales manager.

The company reports a good increase in sales for 1931 and the prospects for 1932 as bright. Additional machinery has recently been added to the mill and several new items are in the course of manufacture.

Chicago Paper Market Practically Unchanged

Manufacturers of Fine Paper, Book and Cover, Experience Persistent Request From Repleted Inventories—Steadier Quotations Noted as Harbinger of Improved Demand — Kraft Wrapping Paper Distributors Become More Optimistic

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., January 25, 1932—The improvement noted in the Chicago paper market as the New Year came in has failed to hold firmly, according to reports from manufacturers, jobbers and sales representatives in this vicinity. There is a continued tendency to believe, however, that the worst is over, and that some strengthening of prices is an indication that paper manufacturers are in a good position to benefit from the long expected turn in general business. Fine paper, books and covers, etc., seem to be more favored, as the regular request from repleted inventories continues. Strengthening of prices is noted as a harbinger of better demand. Ground woods continue dull, while the news print market goes into another year with the hope that stimulated business will aid in creating a better demand. At present the market is practically unchanged over last week. Parchments are reported dull. The stronger tone in kraft prices created a bit more rosy picture for kraft jobbers and distributors in this territory. Old papers continue rather dull, with no important changes noted during the week.

J. E. Bryan Addresses Paper Salesmen

J. E. Bryan, traffic manager of the Wisconsin Pulp and Paper Manufacturers Association, spoke at the Monday, January 18, meeting of the middle West Division of the Salesmen's Association of the Paper Industry. That his discussion was timely was indicated by the amount of questions asked of him relative to the December 3 ruling of the Interstate Commerce Commission as to freight rates. Mr. Bryan pointed out that the changes were subject to revision following a close study of the effects of the rates. Not only did he discuss the matter from the standpoint of paper, but also from that of paper supplies. He spoke of the fact that the recent changes branched away from the blanket rates and were based somewhat on a mileage basis, resulting in decreased rates in certain parts of New England, for example, and in further reductions in points along the Atlantic Coast and up into Maine. Mr. Bryan also mentioned the effects on Michigan and Wisconsin mills and spoke of the recent tendency of these mills to truck their products to Chicago, as the railroads began to halt certain stop-over privileges. The Commerce decision, resulting in a three cent increase in costs to the mills in that territory was materially forcing the business to the trucks. He added, however, that the mills were fully aware of the problem of the railroads and believed that, with certain stop-over privileges returned and with reductions to come later the railroads would again be carrying the bulk of the business from the two states.

Paperboard Industries Association Meets

An exceptionally fine attendance characterized the January meetings of the Paperboard Industries Association which were held at the Congress Hotel, Chicago, on January 19, 20 and 21. According to H. S. Adler, secretary of the association, the number of executives on hand was very gratifying and an indication of the importance with which the industry holds the work of the association. Discussions of the Folding Box, Paperboard and Container groups were held on January 20 with H. C. Stevenson, F. C. Ash and M. M. Madison, vice presidents, respectively, of the three divisions, in charge of the meetings. At the general meeting of the three groups in joint session, held on January 21, much of the program for 1932 was discussed with President Henry D. Schmidt presiding. A close tie-in with problems affecting all industries, such as unemployment, better distribution methods, improved standards of competition, standardization, etc., is expected as the result of this meeting.

Another feature, comparatively new, was the round table conference of container group executives held January 20. A large number of sales executives from these firms were in attendance and spoke freely of the particular marketing and distribution problems affecting their industry. The round table conference was characterized as an effective method of airing problems and difficulties and of arriving at harmonious and amiable decisions relative to perplexing policies accentuated by present day conditions. President Schmidt and Vice-President Madison, of the Container Group, were both present, the latter conducting the meeting and the former adding considerably to the discussions themselves.

Paper Industry of Illinois

According to the biennial census of manufacturers, 1929, Illinois had 29 firms devoted to the manufacturing of paper and 30 to the making of paper goods (not elsewhere classified). The 29 paper manufacturers had 354 salaried officers and employers and 3,675 wage earners, paying salaries totaling $1,118,686 and wages of $5,266,787. The cost of materials, containers for products, fuel and purchased electric energy was given at $19,977,220 and the value of products manufactured by the so-classified paper group was listed at $34,438,372. The value added by manufactures was listed at $14,461,452.

The 30 manufacturers of paper goods listed 393 salaried officers and employees and 1,475 wage earners (average for the year). Salaries paid totaled $1,293,965 and wages $2,158,958. The cost of materials, containers, fuel and purchased electric energy was given at $8,893,486 and the value of products manufactured was given as $18,232,378. The value added by manufactures was listed at $9,338,892.

Hammermill Wins Appeal

Justice Clauson, in the Chancery Division of the English High Court, has allowed an appeal by the Hammermill Paper Company, of Erie, Pa., against a decision of the Registrar of Trade Marks, who had previously allowed the application of Alexander Pirie & Sons, Ltd., of Aberdeen, for registration of the trade mark "Abermill Bond, Made in Great Britain," for writing paper.

The application was opposed by the American company mainly on the ground that they had registered as a trade mark the word "Hammermill," under which name they did a large trade in America and Britain. They said that confusion would arise between the two words. Messrs. Pirie said that the Hammermill mark was not in their minds when they chose the word "Abermill." The latter word was an abbreviation of "Aberdeen" and "Mill."—*Aberdeen* (Scotland) *Weekly Journal.*

Pennsylvania Paper Mills Curtail Output

Majority of Keystone State Manufacturers Report Half-Time Operations—Inquiries for Both Fine and Coarse Paper Broadening, Indicating Brighter Outlook for Near Future —Paper Box Makers Gradually Becoming More Active

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., January 25, 1932.—Typical January reaction from the livelier paper market of the holiday season brought the local industry to the usual dull and waiting attitude of former years. There is, however, a broadening of inquiries for both fine and wrapping paper, indicating a solid background for revival on any evidence of a turn towards improvement. It clearly signifies that consumers are low in paper supplies, despite the tendency to hold up purchases.

Manufacturers report half time operations in most mills. Inquiries are broadening, but orders are slow in landing. Many mills are cleaned up on stocks held over from last year and producing only for orders already at hand. Converters state there is listlessness in their branch of the industry, both bag and container manufacturers having little 1932 business of consequence. Box makers are more active than the majority of converters, with the exception of those handling cellophane products. Building supplies are moving in restricted quantities.

Garrett-Buchanan Co. Expands Facilities

Larger quarters have been acquired by the Garrett-Buchanan Company at 18-20 South 6th street, for sales and display rooms, with inauguration of a consulting service for the fine paper consuming industries. Vice President E. A. Keller, reports that the Garrett-Buchanan Company has been able to show a fair margin of profit in its summary of 1931 business and in view of the general conditions, is satisfied with its ability to hold such record.

Carl Maglathlin Introduces New Wheelwright Papers

Carl Maglathlin, who represents the George W. Wheelwright Paper Company, Leominster, Mass., will leave shortly for his Southern trip, introducing the newest lines of that concern, which already have been shown the Philadelphia distributors, and are ready for stocking. They include the new offset grade; the Biarritz Deckling Vellum for greeting card stock; the Agate, a specialty with a distinctive finish colored "look through" or two tone effectiveness. The Philadelphia district manager will spend the next three weeks in the Southern field.

Plans Supply and Equipment Exhibit

An exposition of paper box manufacturing equipment and supplies in paper goods and accessories is planned by the National Paper Box Manufacturers Association, with headquarters in the Liberty Title and Trust Building here, in conjunction with the annual convention to be held at the Book-Cadillac Hotel, Detroit, Mich., May 10 to 13. The exposition will include supplies for the set-up, folding box and fiber can and tube industries, and equipment used in manufacture of these. A. B. Coffman, 35 East Wacker Drive, Chicago, has been appointed exposition manager.

American Fiber-Velope Adds Bank Envelope

Perfection of an entirely new idea in bank mailing envelopes, and the marketing of these, is announced by the American Fiber-Velope Manufacturing Company, 229-231 North 63rd street, manufacturers of rope fiber, pure jute, kraft and manila envelopes, portfolios, wallets, files and folders. The new bank mailing envelope is called the "Crumble Flap" which does away with the old style metal lock, in as much as there are no attachments or protuberances. These envelopes cannot be steamed or tampered with and any attempt to open them is readily detected in the Crumble flap. They are rapidly gaining favor and adoption by bankers. The Crumble Flaps are less expensive than the metal locks and are an evolution in envelopes and pilfer proof products. They are made in all sizes. The American Fiber-Velope Manufacturing Company has added extra units in special equipment for the manufacture of its own "Fiber-Velopes."

C. S. Garrett & Son Corp. In Receivership

The hardships of the past year in the building and roofing paper supply market is reflected in the receivership of the C. S. Garrett & Son Corp., 20 South Market street, the oldest paper distribution concern of its kind in the local industry, with a business history of almost a century. The firm became involved in involuntary bankruptcy in the United States District Court here, creditors filing the petition being: the Flintkote Corporation, $5,043; Coopers Creek Chemical Company, $400; and the J. L. N. Smythe Company, $104.

Receivership for Industrial Paper Products Co.

Another paper concern involved in receivership proceedings is the Industrial Paper Products Company, Inc., 313 New street, converters and dealers in paper bags, wrapping paper, and specialties. No schedule was filed of assets or liabilities.

Purity Fibre Products Corp. Expands

Having recently opened a large manufacturing plant for the production of fiber baking and food dishes at 2235 East Ontario street, the Purity Fibre Products Corporation has expanded its production and staff to meet needs for increase in demand. There have been installed more units, providing for ten times former capacity, with additional help to take care of the increased facilities.

P. H. Glatfelter Heads Safety Council

At the annual meeting of the York County Safety Council, held in York County, Pa., last week, P. H. Glatfelter, head of the P. H. Glatfelter Paper Company, Spring Grove, Pa., was re-elected president of the organization, represented at the meeting by 150 officials and employees of all the larger manufacturing concerns of the county.

J. L. Taylor With Paper House of Pennsylvania

J. L. Taylor, formerly with the Charles Beck Paper Company, is now on the sales staff of the Paper House of Pennsylvania, representing its printing paper division.

A. P. W. Pulp & Power Elects Officers

At the annual meeting of stockholders of the A. P. W. Pulp and Power Company, Limited held in Albany on January 20, the following officers were elected: Donald G. Kibbey, president; Ledyard Cogswell, Jr., vice president; Isadore Bookstein, secretary; Francis Dougherty, treasurer.

Fox River Valley Safety Conference Planned

Big Annual Meeting Scheduled for Appleton, Wis., May 20, Next—Pulp and Paper Section Will Be In Charge of H. D. Banta, of Hoberg Paper & Fibre Co., Green Bay—Will Probably Attract Approximately 1,500 Executives and Foremen

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., Jan. 25, 1932—Plans were set up at a meeting at Appleton, Wis., last week for the big annual safety convention of the Fox River Valley and Lakeshore Safety Council. It is to be held at Appleton May 20, and will attract approximately 1,500 executives and foremen of paper mills and other industries. William Ashe, of the Thilmany Pulp and Paper Company, Kaukauna, Wis., was appointed general chairman. W. Dean Kiefer, of the National Safety Council, Chicago, was present to assist.

While industrial safety will again be given emphasis, the subject of public safety also will be made a part of the program. Some of the speakers will be selected accordingly. Sectional meetings are to be held part of the day. The pulp and paper section will be in charge of H. D. Banta, of the Hoberg Paper and Fibre Company, Green Bay, Wis.; the metal section, C. E. Saecker, Appleton Machine Company, Appleton; and the power group, William Shubert, Wisconsin-Michigan Power Company. Kenneth Corbett, secretary of Appleton Chamber of Commerce, will serve as secretary of the convention.

Others not mentioned above who attended the arrangements meeting were: J. J. Plzak, Consolidated Water Power and Paper Company, Wisconsin Rapids; G. R. Stearns, Interlake Pulp and Paper Company, Appleton; W. C. Wing, Jr., Fox River Paper Company, Appleton; R. W. Mahoney, Appleton Coated Paper Company; A. F. Kletzien, Fox River Paper Company, Appleton; M. G. Hoyman and F. F. Martin, Kimberly-Clark Corporation, Neenah.

Menasha Mill Supply Co. Formed

Another paper stock company came into existence with the incorporation in Wisconsin of the Menasha Mill Supply Company, Menasha, Wis. Papers were signed by Fred M. Rosenthal, Phoebe Rosenthal and M. Moll, all of Appleton, Wis. Mr. Rosenthal has been connected with waste paper brokerage for mills of the Fox River Valley for a long period. The company's purpose is stated to be the "packing, grading, sorting, buying and selling of paper, waste materials and merchandise of every kind and nature." Stock consists of 600 shares with no par value.

Safety School Meetings

Industries of Neenah and Menasha, Wis., largely paper mills and converting plants, will hold their weekly safety schools as in other years beginning Monday of this week. Among those selected as chairmen of meetings are: S. F. Shattuck, vice president, Kimberly-Clark Corporation; Fred VanLieuw, Kimberly-Clark Corporation, and George Banta, Jr., Banta Publishing Company.

Nekoosa-Edwards Re-elects Officers

No changes were made in the official personnel of the Nekoosa-Edwards Paper Company, Port Edwards, Wis., at the annual meeting of stockholders last week. Officers and directors re-elected are: L. M. Alexander, president and treasurer; John E. Alexander, first vice president and general manager; Judson G. Rosebush, vice president; C. A. Jasperson, secretary; members of board, L. M. Hanks, Madison, Wis.; G. W. Kirby, Chicago; L. E. Smith, Nekoosa, Wis., and J. B. Nash and Guy O. Babcock, Wisconsin Rapids, Wis.

While the company has operated on reduced schedules at times during the last year, all eight machines are now going full time and will continue full production for some time to come because of increased demand, according to Franz Rosebush, employment manager. All men who had been laid off and those working part time were restored to full time jobs.

News of the Industry

In order to overcome variation of color in paper, the Dells Paper and Pulp Company, Eau Claire, Wis., intends to abandon use of water from the Eau Claire River and sink wells. Test wells are being drilled now on the company's property in the hope that water will be found free of iron and manganese. The river water has been specially unsatisfactory in the Spring, when the level is high and there is much foreign matter in the stream.

J. C. Justin, J. E. Bryan, and W. B. Dalton, of the Traffic Association of Wisconsin Paper Manufacturers, attended a hearing at Madison last week before the State Public Service Commission. They gave their views on the petition of steam railroads operating in Wisconsin for increases in intra-state freight rates to conform to increases granted by the Interstate Commerce Commission.

A booklet has been issued by the Institute of Paper Chemistry at Lawrence College, Appleton, Wis., describing the courses, aims and purposes. It is the first publication of its kind since the institute was started and will be supplied to all those desiring information.

International Pulp Co. Meets

[FROM OUR REGULAR CORRESPONDENT]

GOUVERNEUR, N. Y., January 23, 1932.—The annual meeting of stockholders of the International Pulp Company was held here this week at which directors and officers for the year were chosen. The directors elected included Michael Doyle and Kendall B. Castle, of Rochester; William C. Geer and Frank P. McCarthy, Troy; S. J. McCrimlisk, W. H. Stillhamer and Charles N. Rambo, New York City; W. D. Mahoney, Averill Park, and F. N. Belding, Rockville, Conn. Officers for the year are as follows: Michael Doyle, president; William C. Geer, vice president; W. R. Stillhamer, assistant treasurer; S. J. McCrimlisk, secretary, and J. J. Wallace, general manager. Announcement was also made that the regular dividends on preferred stock had been distributed to stockholders during the past year.

In speaking on business conditions Mr. Doyle said that there are many indications that the volume of business will be greater in 1932 than in the preceding year. He finds that the commerce of the nation is adjusting itself to changed conditions besides acquiring an impulse to go forward. "The federal government is taking prompt and effective action to assist in overcoming the depression," he said, "and the appointment of Charles G. Dawes, former ambassador to Great Britain, to administer the reconstruction will be hailed with satisfaction by the people of the nation. It means that a maximum amount of good to the country will follow the use of such a large fund. The important thing needed now is confidence and the ability to go forward and do our business as formerly."

Final Annual Meeting Program

Pennsylvania Hotel, New York, N. Y., February 15-18, 1932

MONDAY, FEBRUARY 15

10:00 A.M. Parlor 2

Common Problems of Technical Men and Wood Department Managers, G. N. Ostrander, Finch, Pruyn & Co., Chairman, pulpwood committee, A. P. P. A.

Pulpwood Evaluation, C. E. Curran, Forest Products Laboratory.

Pulpwood storage and Handling in Woodyard, R. D. Stephens, Eastern Manufacturing Company.

Pulpwood Grading, Howard Churchill, Finch, Pruyn & Co.

The Timber Conservation Board, Ripley Bowman, secretary, Timber Conservation Board.

2:00 P.M. Parlor 2

Purposes of Raw Materials Division of TAPPI, J. L. Parsons, Hammermill Paper Company, chairman, Raw Materials Division of TAPPI.

Fibrous Materials for Paper Making in the Future—*technical discussion*—John Traquair, Mead Corporation, chairman, Fibrous Raw Materials Committee, TAPPI. *economic discussion*—R. S. Kellogg, News Print Service Bureau.

Effect of Kinds and Qualities of Pulpwood upon Pulp Quality, Otto Kress, Institute of Paper Chemistry.

Pulp Manufacturing Costs, C. W. Boyce, A. P. P. A.

TUESDAY, FEBRUARY 16

9:30 A.M. Grand Ball Room—General Session

President's address—M. A. Krimmel.

Secretary's report—R. G. Macdonald.

Business Meeting—Articles of Organization.

Papers: The Use of Optical Instruments for Research in Pulp and Paper, by B. M. Rowland and H. F. Lewis, Institute of Paper Chemistry.

The Relation of Sheet Properties and Fiber Properties in Paper III—The Effect of Fiber Length in Sheet Properties, by R. H. Doughty, Forest Products Laboratory.

Electron Tubes in the Paper Industry, by C. P. Bernhardt, Westinghouse Electric and Manufacturing Company.

2:00 P.M. Parlor C

Engineering Division—W. G. MacNaughton, general chairman.

Materials of Construction—J. D. Miller, chairman.

Papers: Alloy Steel in the Sulphite Industry, by Andreas Christensen, Rhinelander Paper Company.

Effect of Alkaline Liquors on Some Alloys, by G. H. McGregor, Institute of Paper Chemistry.

Alloy Cast Iron for Use in the Paper Industry, by J. S. Vanick and F. L. La Que, International Nickel Company.

Carbon Digester Linings, by A. D. Camp, National Carbon Company.

Rubber Covered Rolls, Construction and Uses, by E. Peterson, B. F. Goodrich Rubber Company.

Materials of Construction Service Records, by J. D. Miller.

Chemically Prepared Wood for Paper Mill Construction, by H. E. Davis, Grasselli Chemical Company.

2:00 P.M. Parlor B

Management Division—W. R. Maull, general chairman.

Waste—C. M. Baker, chairman.

Papers: Effect of White Water Utilization on Sheet properties, by E. R. Schafer, Forest Products Laboratory.

White Water Showers, by C. M. Baker.

Foam Control, by E. F. Whittington, Sutherland Paper Company.

Shrinkage Reduced by Chlorination, by H. W. Richter, George O. Jenkins Company.

Slime Control, by C. M. Baker.

2:00 P.M. Parlor 1

Testing Division—E. O. Reed, general chairman.

Paper Testing—B. W. Scribner, chairman.

Papers: Hygrometry in Paper Testing, by F. T. Carson, Bureau of Standards, Washington, D. C.

Relation of Atmospheric Humidity to Moisture Content of Paper, by R. H. McKee and G. H. Shotwell, Columbia University.

Determination of Rosin in Paper, by E. Sutermeister and W. V. Torrey, S. D. Warren Company.

Determination of Unbleached Sulphite, by E. Sutermeister.

Factors Affecting Results Obtained with Penescope Sizing Testers, by C. E. Libby, New York State College of Forestry.

Effect of Volume of Fresh Air in Heat Test for Stability of Paper, by P. F. Wehmer, Electrical Testing Laboratories.

Calibration of the Elmendorf Tearing Tester, by J. d'A. Clark, Mead Corporation.

Tearing Test for Paper (revised official method).

Water Resistance of Paper, by P. W. Codwise.

WEDNESDAY, FEBRUARY 17

9:30 A.M. Parlor B

Operating Division—F. C. Clark, general chairman.

Preparation of Non-Fibrous Materials—K. A. Taylor, chairman.

Alkaline Pulping—E. S. Hinman, chairman.

Papers: Alkaline Recovery Patent Review, by C. L. Wagner, J. O. Ross Engineering Corporation.

Deinking of Book Paper, by H. A. Morrison, Oliver-United Filters Inc.

Operation of Continuous Caustic Recovery Plants, by W. E. Piper, Dorr Company.

Acid Pulping.

Papers: Effect of Relatively High Sulphur Dioxide Concentration in Sulphite Pulping, by G. H. Chidester and J. N. McGovern, Forest Products Laboratory.

A Comparison of the Pulping Value of Russian and Canadian Spruce Pulpwood by the Sulphite Process, by W. H. Monsson and G. H. Chidester.

The Sulphite Pulping of Slash Pine (if ready).

A New Sulphur Burner, by R. F. Bacon, Texas Gulf Sulphur Company.

Sulphur Burning Equipment for Sulphite Mills, by Asbjorn Aasen, M. W. Kellogg Company.

Mechanical Pulping—J. H. Slater, chairman.

Papers: The Grinding of Slash Pine (if ready).

Evaluation of Groundwood Pulps (if ready).

Stuff Preparation—James Coghill, chairman.

Papers: Continuous Batch Beating, by C. W. Morden, Morden Machine Company.

Paper Manufacture—L. M. Yoerg, chairman.

Papers: Wires and Felts, by L. M. Yoerg and R. W. Pattison, American Writing Paper Company.

9:30 A.M. Foyer Banquet Hall

Engineering Division—W. G. MacNaughton, general chairman.

Heat and Power—M. H. Teaze, chairman.

Papers: Solids in Boiler Flue Gas, by Jepj C. Hardigg.

Integrated Power Economics, by Walter N. Polakov.

Insulation for Electrical Equipment by E. C. Dieffenbach, General Electric Company.

Causes, Effects and Remedies for Low Power Factor, by R. H. Rogers, General Electric Company.

Pumping Wood Pulp and Paper Stock, by M. M. Klosson, Buffalo Pumps Inc.

Steam Saving by Use of Forced Circulation Evaporator, by W. T. Hinkley, Swenson Evaporator Company.

Heat Requirements for Drying of Coated Paper, by E. G. Milham and Severns Balch Watervliet Paper Company.

Evaluation of Paperboard Drier Performance, by F. C. Stamm, Upson Company.

Drying Paper on Yankee Driers, by R. S. Wertheimer, Longview Fibre Company.

Power Requirements for Auxiliary Paper Mill Equipment, by R. Trautschold

Discussion: Comparative Standard Statistics for Power Plant Operation, A. G. Darling, General Electric Company.

9:30 A.M. Parlor 1

Testing Division—E. O. Reed, general chairman.

Pulp Testing—D. E. Cable, chairman.

Papers: Water Solubility of Wood and Pulp.

Pulp Consistency Variables in the Pebble Mill Test, by F. C. Peterson and Frank Makara, New York State College of Forestry.

Initial Strength Testing of Pulp, by James d'A. Clark, Mead Corporation.

Rapid Determination of Moisture Content of Pulp, by M. A. Youtz, Northern Paper Mills.

Flobility and Springback of Pulp and Board, by R. B. Brown of D. Manson Sutherland Jr.

Determination of Methoxy Content of Sawdust and Pulp, by P. S. Billington, Forest Products Laboratory.

Determination of Cuprammonium Hydroxide Viscosity of Pulp, by M. D. Reuben, York Haven Paper Company.

Determination of Copper Number of Pulp, by N. L. Nourse, Brown Company.

Effect of Potassium Permanganate on Cellulose and Pulp in its Relationship to Bleachability Tests, by H. K. Benson, V. Sivertz and Wells Grant, University of Washington.

1:00 P.M. Grand Ball Room

General Association Luncheon. The seating plan will be according to committees. All members of the association and their friends are welcome. Anyone who is not a member of a committee may sit at the table of any committee that may be of interest to him.

C. L. Warwick, secretary of the American Society for Testing Materials will be our guest speaker.

C. W. Rivise, chairman of the TAPPI Patents Committee, will discuss The Rights of Employers and Employees in Inventions Developed During the Period of Employment.

Every committee chairman is expected to have two reports ready, one dealing with committee activities and plans, the other being a record of the major developments of the past year in the field served by the committee.

Following this each committee will have a round table discussion of the committee plans and projects. Every member of the Association present should sit in at one of these committee meetings.

THURSDAY, FEBRUARY 18

9:30 A.M. Parlor 1

Operating Division—F. C. Clark, general chairman.

Finishing, Processing and Converting—J. J. O'Connor, chairman.

Papers: Paper Coating Strength Factors, H. R. Rafton, Raffold Company of America.

Handling and Drying Single Coated Paper, by H. G. Rappolt, John Waldron Corp.

Value of Laboratory Tests of Casein, by E. O. Whittier, Bureau of Dairy Industry.

Reports of subcommittees.

9:30 A.M. Parlor C

Research and Development Division—C. E. Curran, general chairman.

Use Requirements—P. K. Baird, chairman.

Use Requirements Survey Progress Report.

Papers: The Porosity of Papers I—An Improved Emanuelli Test, by R. H. Doughty, C. O. Seborg and P. K. Baird, Forest Products Laboratory.

The Porosity of Papers II—The Effect of Basis Weight and Solid Fraction on the Porosity of Simple Papers, by Doughty, Seborg and Baird.

The Rate of Reaction of Moisture Regain in Paper, by R. H. McKee and H. G. Shotwell, Columbia University.

9:30 A.M. Parlor 2

Engineering Division—W. G. MacNaughton, general chairman.

Equipment—E. F. Bearce, chairman.

The purpose of this meeting is to briefly review the new developments that have taken place relative to the application of equipment to the pulp and paper industry. It is expected that this meeting will be followed each year by similar meetings, so that in the course of time the history of equipment developments will be recorded.

To avoid repetition the equipment developments reported at other sessions of this convention will not be reported at this meeting.

Subjects: Some of the subjects covered at this meeting include:

Synchronized Supercalender and Winder Drives.

ELECTRICAL DEVELOPMENT

The Lodding Doctor.

High Speed Dandy Roll at Dalhousie Mill of the International Paper Co.

Application of Doctor to Press Rolls.

Chlorination.

Rewinding and Slitting.

Agitating Equipment.

Paper Machine Developments.

Board Forming Machine.

Schuster Magnetic Gauge.

Potentiometers and Pyrometers.

Relative Humidity Instruments.

Material Handling Equipment.

Recording Instruments.

1:00 P.M. South East Ball Room

General Association Luncheon—M. A. Krimmel, chairman.

Addresses: Vocational Education Survey of the Pulp and Paper Industry, by Frank Cushman of the Federal Board of Vocational Education.

Dr. H. P. Wriston, president of Lawrence College, Appleton, Wis.

(Continued on page 52)

Paper and Pulp Production in November

According to identical mill reports to the Statistical Department of the American Paper and Pulp Association from members and cooperating organizations, the daily average of total paper production in November decreased 4 per cent under October and 5 per cent under November 1930. The daily average wood pulp production in November was 8 per cent above October, 1931, and 4 per cent below November, 1930.

Grades That Showed Decreases

Compared with November a year ago, the daily average production registered a decrease in the following grades: Uncoated book, paperboard, wrapping, tissue, writing, and hanging papers. Compared with October, 1931, the following percentage decreases were registered in the daily average production: Paper board, 10.2 per cent; bag, 5.7 per cent; wrapping, 3.3 per cent; tissue, 4.3 per cent, writing, 6.2 per cent; and building, 15.5 per cent.

The eleven months' cumulative total of production of paper was 9.2 per cent below the corresponding period in 1930 while shipments were 8.6 per cent smaller than a year ago. News print, uncoated book, bag, hanging and building papers have shown improvement while paperboard and writing papers showed practically no change in production at the end of the eleven-month period as compared with the end of the ten-month period.

Production of Wood Pulp

The eleven months' cumulative total of wood pulp production for 1931 was reported as 14.7 per cent below the level of the same period in 1930.

Total shipments of wood pulp to the outside market were 29.3 per cent below the level of the eleven months' total of 1930. Bleached sulphite, mitscherlich sulphite and kraft pulp shipments to the open market were greater than in the first eleven months of 1930.

Total wood pulp inventories showed an increase, and at the end of November were 5.5 per cent above the level of November, 1930. All grades, excepting bleached sulphite, kraft and soda pulp, showed inventories above the level of November, 1930.

REPORT OF PAPER OPERATIONS IN IDENTICAL MILLS FOR FOR THE MONTH OF NOVEMBER, 1931

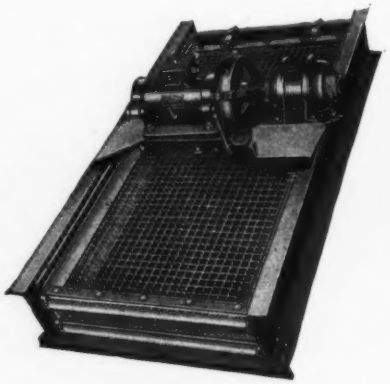
Grade	Production tons	Shipments tons	Stocks on hand end of month tons
News print	94,149	93,723	32,398
Book, uncoated	63,171	62,338	46,421
Paper board	138,206	136,810	58,166
Wrapping	37,419	37,012	46,758
Bag	11,151	11,014	5,065
Writing, etc.	19,293	19,614	43,197
Tissue	5,043	4,883	3,947
Hanging	3,371	3,036	3,252
Building	3,944	3,691	3,399
Other grades	13,630	13,158	13,982
Total all grades, Nov., 1931	389,377	385,279	256,585
Total all grades, 11 mos., 1931	4,768,832	4,771,025	256,585
Total all grades, 11 mos., 1930	5,249,445	5,218,378	266,805

REPORT OF WOOD PULP OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF NOVEMBER, 1931

Grade	Production tons	Used during month tons	Shipped during month tons	Stocks on hand end of month tons
Ground wood	73,994	68,291	467	54,852
Sulphite, news grade	25,698	24,747	634	6,476
Sulphite, bleached	16,694	13,751	2,524	3,497
Sulphite, easy bleaching	2,333	1,841	365	1,473
Sulphite, Mitscherlich	2,968	2,003	780	1,704
Kraft pulp	25,273	20,099	4,939	3,289
Soda pulp	12,559	9,849	2,419	2,866
Other grades	384	372	50	118
Total all grades, Nov., 1931	159,903	140,953	12,178	74,275
Total all grades, 11 mos., 1931	1,844,445	1,682,409	157,033	74,275
Total all grades, 11 mos., 1930	2,161,773	1,933,740	222,015	70,416

Efficient Handling of Wood Chips

The Leahy Chip Screen herewith illustrated, is a development of an idea which has been used in mining industries in the separation of ores. It has already demonstrated its efficiency and economy in the handling of wood chips, as is evidenced by the many installations already in use in pulp mills. The Leahy Chip Screen is a double surface screen in the 4 ft. by 7 ft. size and can be either driven by belt or direct motor drive. The upper surface removes the large pieces, bark and other foreign matter. The lower surface removes the sawdust and fine dirt.



Through the unique differential vibration of the Leahy Screen better grading is made possible, consequently producing better wood chips which are the intermediate product of the screen.

It is stated that immediately after the Leahy Screen is placed in operation the dirt count in the chip screens has been reduced by at least 20 per cent. A single unit screen is capable of handling approximately 200 cubic feet of material from the chippers, thus giving a normal capacity of 80 tons in eight to ten hours' operation.

Another feature is that the vibration is confined to the screen jacket and is not transmitted to the screen frame, the supporting structure or building.

The Leahy Wood Chip Screen is manufactured by the Deister Concentrator Company, Inc., at Fort Wayne, Ind., who will be pleased to furnish further information.

Injunction Against Paper Mill Denied

[FROM OUR REGULAR CORRESPONDENT]

CAMDEN, Ark., January 25, 1932—Chancellor George M. LeCroy in a written opinion last week denied the injunction petition brought by the state against the Southern Kraft Corporation, operator of a paper mill here, alleging stream pollution. His decision ended a long litigation. The case was heard recently and more than 40 witnesses testified.

The chancellor ruled that the city sewerage, waste from the refinery and also the paper mill were discharged into Two Bayou and then into Ouachita River. Any or all three of these may have caused fish to be killed on July 9, the date which the state alleged the paper mill killed the fish. On July 8, a cloudburst flushed the bayou in which sewerage, waste of the paper mill and the refinery had accumulated and Chancellor LeCroy held that this factor, combining all three waste matters, may have caused the fish to die. He suggested dredging the bayou to make it deeper.

This is the second time the injunction suit against the paper mill for stream pollution has been denied. The first was in 1928, soon after it had begun operations here.

clean paper *builds* prestige

With Bird Centrifiners you make really clean paper . . . safeguard current sales and profits. Yet a Centrifiner installation is also the greatest single contribution you can make to the long-term reputation of your mill. *Prestige helps sell your paper. You need Bird Centrifiners.*

BIRD MACHINE COMPANY **SOUTH WALPOLE, MASSACHUSETTS**

manufacturers of the Bird Centrifiner under license from the Centrifugal Engineering & Patents Corp., owners of the Erkenator Patents.

BIRD CENTRIFINERS

5048

Obituary

Frederick M. Hodge

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., January 22, 1932—Frederick M. Hodge, 73, who retired January 13 as president of the Kalamazoo Paper Company, died Tuesday night, January 19, at his home, 136 Thompson street, after an illness of about three weeks. Mr. Hodge was an extremely valuable citizen and his death inflicts a distinct loss on the entire community. As an industrial leader, he had served the Kalamazoo Paper Company as president for 33 years. Under his guidance that concern developed into one of the most successful companies engaged in the manufacture of paper, operating six machines and employing approximately 1,000 men and women.

Mr. Hodge's relations with the trade from every angle were the highest. That applied not only to the customers of the Kalamazoo Paper Company, but employees as well. He was recognized as a friend of labor and it was shown during the existing depression by his refusal to recommend any wage cut for his employes. He was also a director of the Hawthorne Paper Company, the First National Bank and Trust Company and the Sutherland Paper Company.

He was a graduate of Kalamazoo College and had for years been a member of the board of trustees of the institution. He was also identified with the Park Club, Kalamazoo Country Club, Gull Lake Country Club, Current Events Club, Kiwanis Club, Charlevoix Resort Association and numerous other similar activities. His interests were community wide and in everything that helped for the growth or betterment of Kalamazoo he took rank as a leader.

Mr. Hodge was born in Brooklyn, N. Y. When still a boy, his parents, the Rev. Marvin G. and Mrs. Hodge, moved to Kalamazoo and the Rev. Mr. Hodge became pastor of the First Baptist church, of this city. Fred M. Hodge entered the public schools and then Kalamazoo College, graduating from both institutions. With the completion of his school work, he took a position as bookkeeper with the Michigan National Bank, consolidated into what is now known as the First National Bank and Trust Company.

He married Miss Edith Gibson, daughter of the late Samuel A. Gibson, at the time he abandoned his banking connection to go with the Kalamazoo Paper Company. It was under the tutelage of Mr. Gibson that Mr. Hodge was able to gain first hand knowledge of paper mill management. In 1899, Mr. Gibson died and Mr. Hodge was elevated to the presidency of the concern.

In addition to his widow, the immediate family includes four children, two sons and two daughters. Philip G. Hodge, of Roslyn, Long Island, and Winship Hodge, of Brownsville, Texas, both of whom saw service in the World War. His daughters are Mrs. Winifred Appleton and Mrs. Albert J. Todd, both of Kalamazoo. There are ten grandchildren, Sallie Appleton, John, Susane, Mary Jean, Winship and Patricia Todd, all of Kalamazoo; Frederick Hodge, of Brownsville; and Philip, Mary and Max Hodge of Roslyn. A sister, Mrs. David Wilcox, resides in Quincy, Ill.

The funeral was held Friday afternoon at the home, 136 Thompson street, with burial at Mountain Home Cemetery. The Rev. M. Forrest Ashbrook, pastor of the First Baptist church, officiated.

Judge Charles Forrest Moore

Judge Charles Forrest Moore, one of the best loved and most admired figures in the paper industry, celebrated attorney, author, after-dinner speaker, for many years legal representative for the West Virginia Pulp and Paper Company and at one time partner of Judge George K. Anderson of Clifton Forge, Va., died at his home in Lewisburg, Va., on Friday night, January 8. He was at one time judge of the court of Alleghany and Craig Counties, Va. Although he had been stricken with paralysis about ten years ago and had since then been obliged to depend upon a wheel chair as a means of locomotion, his mind remained clear and active and his brilliant intellectual attainments were not dimmed.

Judge Moore was born at Dunmore, Pocahontas County, and had he lived until January 28 would have been 69 years old. He studied law at the University of Virginia and began his practice in Pocahontas County. Judge Moore and Judge Anderson went to Clifton Forge together and formed the law firm of Moore & Anderson there in the boom days of the late 80's and early 90's. Judge Moore was first to be appointed to the bench and served several years before his former partner was given a seat on the bench.

Judge Moore gave up his position as a judge to enter the legal service of the West Virginia Pulp and Paper Company, eventually becoming chief counsel for that great organization. It was he who secured the option on land at Caldwell, where the company was considering locating its plant, but due to opposition that developed in West Virginia he was instrumental in taking the mill to Covington.

Judge Moore lived in New York while in the service of the paper company and there gained a national reputation as an after dinner speaker. He was an honored and welcome guest at many of the annual banquets of the American Paper and Pulp Association, and as late as last year made a scintillating address, for which he was vociferously applauded. Possessed of a brilliant mind, he was able to master any subject to which he gave his attention and his writings gave him added fame. He is known as the author of several books, among them, "The States United and Otherwise," "Parade of the Presidents," "Comradeship," and "Challenge of Life." In addition he was a regular contributor to prominent publications.

Judge Moore, while living in New York, became acquainted with many of the leading men of the day and formed friendships among an influential class of business and professional men that endured ever after. In addition to his more widely known achievements in the fields of law and letters, Judge Moore was a devout Christian, and was for several years a recognized Methodist minister.

His first wife, who was Miss Mollie Beard, preceded him to the grave about thirty-five years ago. One child survives from this marriage, Mrs. Hallie Pace, of Lewisburg. The second Mrs. Moore was Miss Jane Slaughter, of Orange, Va., and survives her husband with one daughter, Mrs. John Matthews, of Washington, D. C. Two brothers, Ernest and Harry Moore, of Dunmore, also survive.

P. J. McGuire Visits Pulp and Paper Mills

[FROM OUR REGULAR CORRESPONDENT]

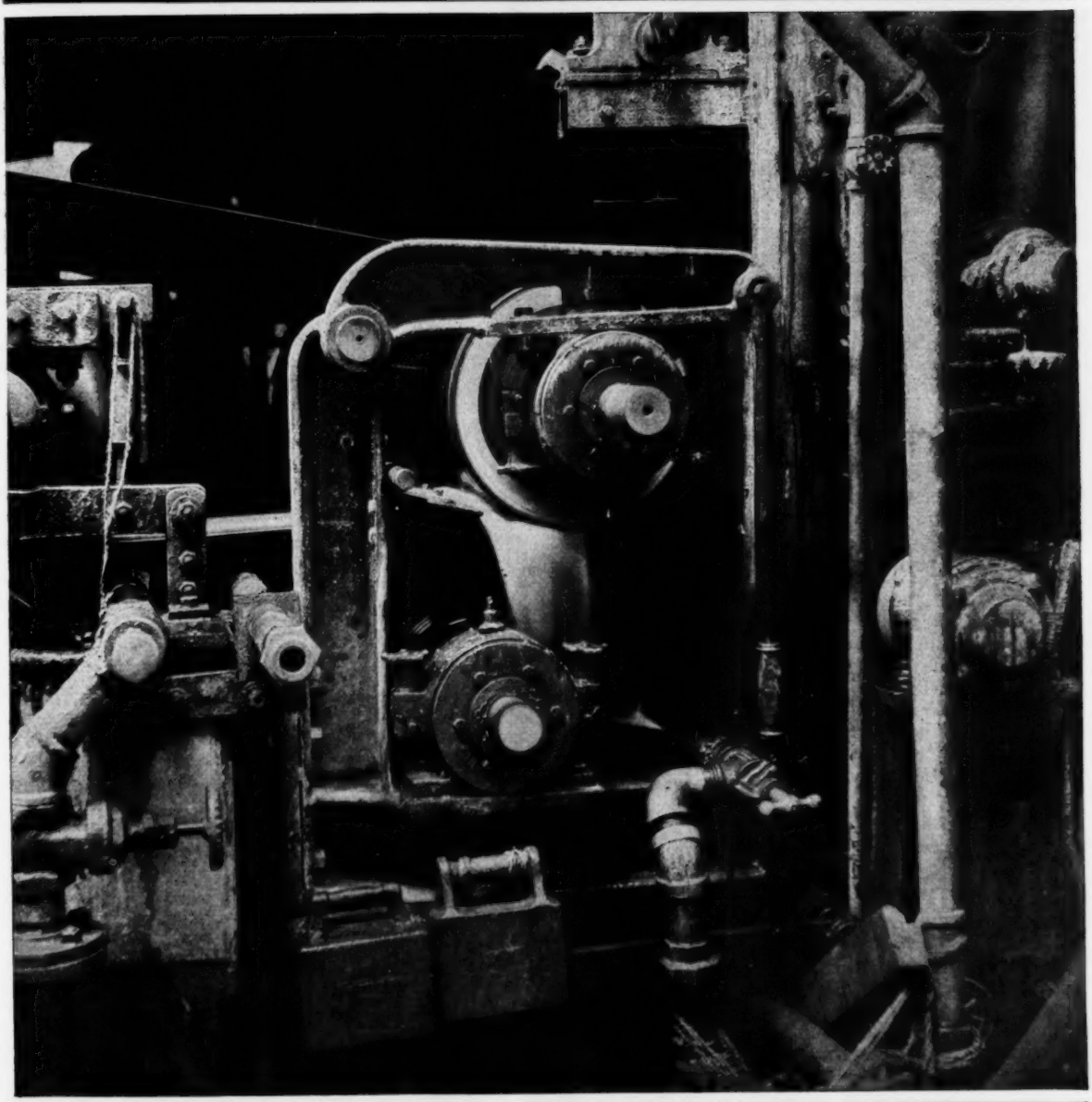
LONGVIEW, Wash., January 23, 1932.—P. J. McGuire, representative of the Oliver-United Filters, Inc., with headquarters in Los Angeles, has been in the northwest visiting pulp and paper mills, with special attention to installations of filters in the new plant of the Weyerhauser sulphite mill just completed at Longview.

200 TONS-24 HOURS-120" TRIM

and the Superintendent says:

"A Board Machine is not complete without an Extractor Roll"

HE HAS ONE — AND IT WORKS LIKE THIS



DOWNINGTOWN

MANUFACTURING CO. — DOWNINGTOWN, PA.

New York Trade Jottings

William Carruthers has resigned as director and secretary-treasurer of the Franklin Paper and Twine Corporation, of 126 Bleecker street, New York, and is no longer connected with that organization in any way whatever.

* * *

H. P. Andrews Paper Company is removing to 14 West 3rd street, New York, and expects to be installed in its new quarters on and after February 1. The new telephone number will be Spring 7-0814.

* * *

The Annual Banquet of the New York Association of Dealers in Paper Mill Supplies, Inc., will be held on the evening of Wednesday, February 17, in the East Ball Room of the Hotel Commodore, New York. As usual, an excellent program is planned and an enjoyable evening is anticipated.

* * *

There was an excellent attendance of members and guests at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, which was held in George's Restaurant, New York, on Tuesday. Business conditions were freely discussed by those present and the general opinion was expressed that the outlook for the future was more promising than for some time past.

* * *

The National Paper Trade Association of the United States will hold its annual invitation luncheon in the Banquet Hall of the Pennsylvania Hotel, New York, on Wednesday, February 17, at 1 p. m. Entertainment will be furnished by the Mills Brothers, of the Columbia Broadcasting System, whose unique music and skits have won nation-wide popularity in recent months. A humorous playlet will also be presented by the Standardization Committee of the American Paper and Pulp Association.

Beveridge-Marvellum Co. To Start

HOLYOKE, Mass., January 26, 1932—A new paper converting company received its charter of incorporation and will begin operations soon it was announced last week by Francis C. Heywood of the Marvellum Company of this city, manufacturer of special decorative papers for envelope inserts and the like in the former Whitmore Manufacturing Company building. The new Company is known as the Beveridge-Marvellum Company and is a subsidiary of the Marvellum Company of this city and the Beveridge Paper Company of Indianapolis. William J. Warner of this city and Samuel B. Sutphin of Indianapolis are co-incorporators with Mr. Heywood. It is understood that the new company will manufacture decorative papers.

Harry D. Eliason Resigns

J. M. Ward, president of the Detroit Sulphite Pulp and Paper Company, announces the resignation of Harry D. Eliason as director of production of the company. During the years of his association with the company, many improvements for the betterment and higher standards of paper were made. The duties that Mr. Eliason performed will be taken over by other members of the organization, under Mr. Ward's direct supervision. The above arrangement is practically the same condition that existed before Mr. Eliason's coming to the company. Mr. Eliason has not as yet announced his plans for the future.

New England Paper Merchants Elect

BOSTON, Mass., January 25, 1932—The annual meeting of the New England Paper Merchants Association was held at the Harvard Club of Boston, Wednesday evening, with about forty present. The retiring president, Floyd H. Blackman, was in the chair. The following officers were elected for the ensuing year:

William H. Rourke, president, Rourke-Eno Paper Company, Hartford, Conn.; Willard H. Loud, first vice-president, Stimson & Co., Boston; E. D. Bement, second vice-president, Carter, Rice & Co., Corp., Boston; George D. Allen, treasurer, Knight, Allen & Clark, Inc., Boston; John H. Brewer, secretary, Storrs & Bement Company, Boston.

Executive Committee—Fine Paper Division, W. E. Porter, Jr., Cook-Vivian Company, and William N. Stetson, Jr., Storrs & Bement Company, both of Boston. Wrapping Paper Division, E. G. Sullivan, L. B. Philbrick Company, Salem, Mass., and H. B. North, F. E. Fowler Company, New Haven, Conn. Representatives to National Paper Trade Association—Charles A. Esty, Carter, Rice & Co., Corp., and Matthew O. Byrne, Whitney Bros., Inc., both of Boston. The newly elected officers were given an ovation and promises of support from members during the coming year.

A. W. Blackman, president of the National Association, spoke on plans for the coming convention in New York next month. Mr. Byrne spoke of the great loss in the death of John F. Kuster and all present stood in silent tribute to his memory. Mr. Stetson, who had been appointed chairman of the Pulp and Paper Group in the $3,000,000 United Boston Unemployment Relief Campaign, gave a talk on his duties in that work.

By a vote the association went on record as opposed to prison-made goods. It was voted that letters be sent to the State senators and representatives expressing the desire that a state law be passed regulating the sale of prison-made goods to conform with the Federal law, called the Hawley-Cooper Bill.

It was the sense of the meeting that merchants should do everything possible to support the mills in their new price on kraft.

Boston Paper Trade Happenings

BOSTON, Mass., January 25, 1932—The campaign on Contract Bond, made by the American Writing Paper Company, is bringing in good returns. This brand is handled locally by Arnold-Roberts Company, Carter, Rice & Co., Corp., John Carter & Co., Inc., and Knight, Allen & Clark, Inc.

Carter, Rice & Co., Corp., are stocking White Seal Coated, a new product of the Oxford Paper Company, Rumford, Me., and issuing broadsides of the paper. The paper is 100 per cent casein sized and has excellent folding and printing qualities.

Henry L. Goodman is mailing to the trade Gold Relief papers in Box No. 66. These papers are made in eight colors by the Marvellum Company, Holyoke.

In the will of John F. Kuster, who was treasurer of the Andrews Paper Company, his entire estate of $40,000 of personal property is bequeathed to his widow.

The Beveridge-Marvellum Company, Holyoke, has been incorporated to deal in paper, textiles, etc. There are 10,000 shares of $10 each. Incorporators: William J. Warner, president; Francis C. Heywood, Holyoke, treasurer, and Joseph J. Pohlmann.

Let this new Goodyear THOR Belt handle that beater drive

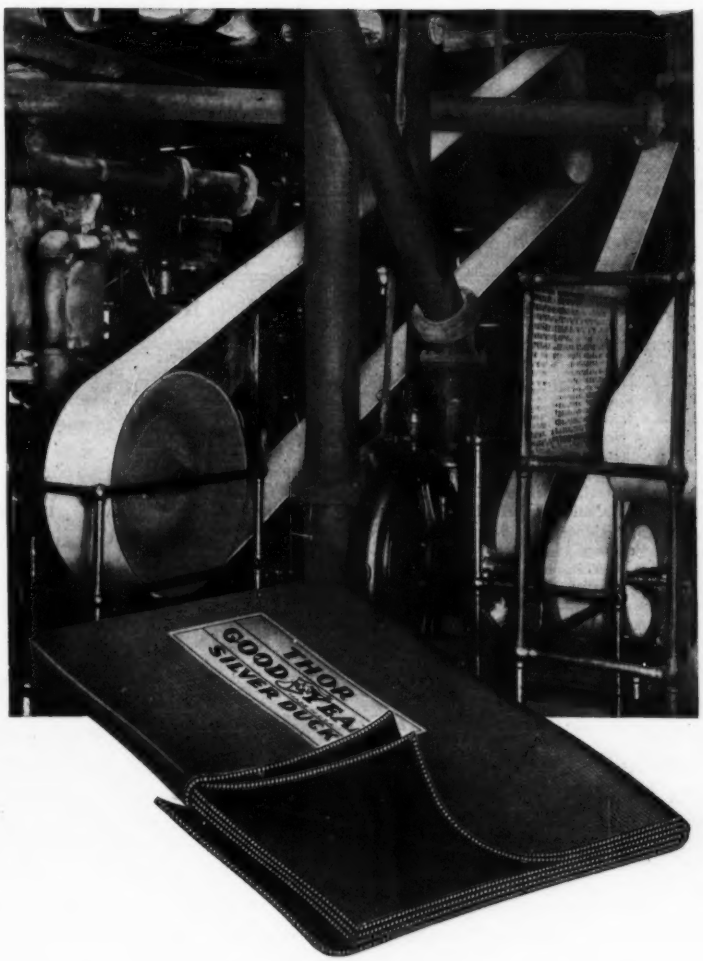
YOU ought to see how the new Goodyear THOR Belt, seamless*, takes to the hard drive duty — on beaters, Jordans, pumps, cone-pulleys and chippers.

Its unique construction — *no center seam to open up under flexing, and a protective envelope that guards the edges against fray.*

It is made of heavy silver-duck, strong at the fasteners, and cushioned and buttressed in tough Goodyear rubber.

Goodyear THOR Belting, seamless*, like all other Goodyear Mechanical Rubber Goods for paper mills—Goodyear Soft-Nozzle Sanitary Hose for wash up purposes, for example—is scientifically specified to its job in your plant by the G. T. M.—Goodyear Technical Man.

The G. T. M. has a record of saving time and costs in many paper mills. If you think he might help you get better belt and hose service at lower cost, write to Goodyear, Akron, Ohio, or Los Angeles, California.



TUNE IN:
Goodyear invites you to hear John Philip Sousa and his Band . . . Arthur Pryor and his Band . . . Revellers Quartet and Goodyear Concert-Dance Orchestra—every Wednesday and Saturday night, over N.B.C. Red Network, WEAF and Associated Stations

** Goodyear* THOR *Belting, seamless, is made in widths up to and including 16" —* THOR *quality of special construction is available for larger sizes*

THE GREATEST NAME IN RUBBER

GOODYEAR

BELTS • MOLDED GOODS • HOSE • PACKING

PAPER TRADE JOURNAL

ESTABLISHED 1872

Published at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices, 10 East 39th St., New York, N. Y.

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Reginald Trautschold, M. E.,
Power Engineering Consultant

Lynne M. Lamm, *Washington Correspondent*

Price, Per Copy, 10 Cents — United States, Per Annum, $4.00
Canada, including tax, $7.50; Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. XCIV New York, January 28, 1932 No. 4

COMING EVENTS

American Paper and Pulp Association, fifty-fifth Convention and Meeting. Pennsylvania Hotel, February 15-18. Annual Meeting, Thursday, February 18. Annual Banquet, Grand Ball Room, Thursday, February 18.

National Paper Trade Association of the United States. Convention, Pennsylvania Hotel, February 15-17. Luncheon, Wednesday, February 17

Technical Association of the Pulp and Paper Industry. Convention, Pennsylvania Hotel, February 15-18. Luncheons, Wednesday, February 17 and Thursday, February 18.

Salesmen's Association of the Paper Industry. Annual Meeting, Pennsylvania Hotel, Tuesday, February 16. Luncheon, Tuesday, February 16.

New York Association of Dealers in Paper Mills' Supplies, Annual Banquet, Hotel Commodore, Wednesday, February 17.

Canadian Pulp and Paper Association. Annual Meeting, Pulp and Paper Research Institute, Montreal, January 27-29.

A PERCEPTIBLE IMPROVEMENT

A perceptible improvement in business sentiment has appeared since the beginning of the year according to a survey of business and finance just completed by the Guaranty Trust Company of New York.

"Thus far, there is no definite evidence to show that the better feeling has been based on actual increases in production and trade, except in certain industries where the suspension or curtailment of operations at the year-end is always followed by expansion in the ensuing weeks," *The Survey* continues. "The more cheerful tone, however, brought about a definite advance in prices of stocks and bonds during the greater part of January.

"Several factors appear to have aided in dispelling the atmosphere of extreme pessimism that existed at the end of 1931. The testimony of bankers before the Finance Committee of the Senate on foreign loans helped greatly to clarify the financial outlook as related to conditions abroad. Foreign news, prior to the indefinite postponement of the Lausanne conference late this month, stimulated hope for an agreement between Great Britain and France concerning reparations and war debts. Some signs have appeared of an increasing investment demand for securities. Opposition groups in Congress have shown a tendency to coöperate with the Administration in its program of legislation to facilitate economic recovery.

"Encouragement has also been drawn from the greater stability in commodity markets. The price index of the Guaranty Trust Company for January 15 stands unchanged at 43.1.

"The statistical reports that have become available this month indicate that the degree of recession in business activity in the closing weeks of 1931 was no greater than is usually witnessed at that season; and weekly data covering operations since the turn of the year are also encouraging, though inconclusive. The index of business activity of the Guaranty Trust Company for December stands at a preliminary figure of 58.8, showing the first upturn since April, 1931. On the whole, the developments of the last few weeks, while mainly intangible in their nature, have been such as to strengthen the hope that 1932 will bring some progress toward the restoration of more prosperous conditions.

"There has been, of course, no sweeping change in underlying factors; and it is recognized that serious problems remain to be faced. Bank failures are still numerous. Many local governments are experiencing great difficulty in meeting their current financial requirements. The real estate situation in numerous localities is unfavorable. General tax increases are inevitable. No substantial revival in construction is visible, or in immediate prospect. Conditions abroad are by no means reassuring; and the outlook certainly has not been improved by the international deadlock that necessitated the postponement of the Lausanne conference on reparations, originally scheduled to begin on January 25.

"At home, there still appears to be a large amount of hoarding. The existing situation forces banks to keep themselves in as liquid a condition as possible and severely restricts them in the exercise of their normal credit functions; for the first duty of banks is to their depositors, and their very existence depends upon the uninterrupted performance of that duty.

"Considerable light is thrown on general expectations for the early months of 1932 by the national forecast of the Regional Shippers' Advisory Boards covering probable freight car requirements for the first quarter of the year. For the country as a whole, the forecast indicates total loadings 6.6 per cent below those for the corresponding period in 1931. While this estimate certainly points to no swift acceleration in railway freight traffic, it suggests a probable increase somewhat greater than is usually witnessed in the first quarter of the year.

"There seems to have been renewed talk in recent weeks of the possibility of the United States being forced to abandon the gold standard. This idea was apparently suggested by the suspension of specie payments in England and several other countries last September and was stimulated by the outward movement of gold due to the

withdrawal of funds from this market by foreign banks in October and November.

"It is difficult to understand how anyone can seriously entertain such a notion at a time when approximately one-half of the world's money gold lies in American bank vaults, and any doubt on the subject should be dissipated by the ease with which foreign demands are actually met. If the gold standard is not safe in the United States at present, then it never has been, and never will be, safe anywhere. Even in the remote contingency that all foreign short-term balances now outstanding in the American market should be called home at once, the demand could be met without reducing the gold reserve of the country to a dangerous level. Any serious consequences that might follow such a development would be purely psychological in their origin.

"If a forced suspension of the gold standard in this country under present conditions is out of the question, its voluntary abandonment is hardly more conceivable. The United States has maintained the integrity of its currency for more than half a century, with highly beneficial results. To alter that policy would not only work great injustice as between debtors and creditors but would shatter the faith of the people in currency stability, creating doubts that would continue to exert their paralyzing effects on economic activity for years to come. The huge stocks of gold in the United States would decrease in value, and this country would be the loser. To offset these disastrous effects, the only clear advantage from the Government's point of view would be to reduce the burden of public indebtedness; and this end would be achieved at the expense of citizens who, in good faith, had lent their money to Federal and local governments. The situation is not likely to reach a point where such a step would be either necessary or justifiable."

Fraser Companies May Reorganize

MONTREAL, Que., January 25, 1932—Interest due on the first mortgage bonds of the Fraser Companies was paid on January 1, and the Restigouche Company, wholly-owned subsidiary, will also meet its bond interest on February 1. Conditions surrounding the Fraser Companies have been far from favorable, and it will be recalled that the position of the company was such that steps were taken during 1930 to bring about an improvement and to that end a group representing the banking interests have since taken an active part in the affairs of the company. The interest on the 15-year debentures was passed April 1 of last year, but payments on the other issues have been met. At the end of last year the company found itself with an operating deficit of over $4,200,000 on the year's business, of which roughly $2,000,000 represented inventory loss; bank loans of over $5,000,000 and a short-term debt of $7,500,000.

As the latter obligation falls due on July 1 of this year, it is thought here that the long-talked-of organization of the companies will soon take place. The material reduction in inventories which has taken place, together with some improvement in business resulting from the completion of the Restigouche plant, are favorable features in this connection.

Purchasing Agents' Service

Jesse H. Neal, general manager of the American Paper and Pulp Association, has announced preparations to furnish the purchasing agents of the industry with a commodity service which will enable them to judge more accurately the supply and demand conditions in the raw materials market.

The American Paper and Pulp Association has received numerous requests for information of this sort and has taken steps to secure the cooperation of the purchasing agents of the paper and pulp industry.

Mr. Neal stated that if purchasing agents in the paper industry knew the condition of raw material stocks throughout the industry, the quantity of forward buying and other conditions of the raw material markets, they would be less influenced by rumors and selling pressure and would be, therefore, in better positions to judge how they would purchase.

This service will be handled by the Statistical Department, under the direction of John A. C. Kavanagh. Mr. Neal pointed out that the Statistical Department was in an excellent position to successfully carry out this work because of the contact with so many mills in the industry, and the previous experience and success of similar services in the past on behalf of independent groups and several group associations.

Bids and Awards for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 27, 1932—The Government Printing Office has received the following bids for 5,000 pounds of lined strawboard: Barton, Duer & Koch Paper Company, 1.75 cents per pound; Whitaker Paper Company, 2.497 cents; Mathers-Lamm Paper Company, 1.825 cents; R. P. Andrews Paper Company, 1.75 cents; The LaBoiteaux Company, 1.975 cents; Virginia Paper Company, 1.75 cents; Lindemeyr Paper Company, 1.75 cents; and Cauthorne Paper Company, 1.77 cents.

The following bids were also received for 500 sheets of 18 x 23 overlay board; E. H. Walker Supply Company, 37 cents per sheet less 2 per cent; R. P. Andrews Paper Company, 41 cents; and George P. Stewart, 40 cents.

R. P. Andrews Paper Company has been awarded the contract for furnishing the Printing Office with 60,000 sheets of 8½ x 14 white sensitized paper at $1.53 per M sheets. The Mathers-Lamm Paper Company will furnish 30 x 40 white tissue paper at $8.50; and the R. P. Andrews Paper Company will also furnish 2,000 pounds of 26½ x 50 per cent rag green cover paper at 10.4 cents per pound. Bids for these items were received on January 4.

Paper Mills Employment

Three hundred and ninety-three paper and pulp mills reported their November employment to the Bureau of Labor Statistics, Department of Labor at 76,849, a decrease of 1.4 per cent from October and of 7.7 per cent from November of 1930. The November weekly payrolls were $1,656,895, a reduction of 2.7 per cent from October and of 20.5 per cent from November 1930.

Reports from 312 paper box factories gave their November employment at 24,309, a reduction of 0.9 per cent from October and of 7.7 per cent from November 1930. Weekly payrolls in these factories in November were $497,681, a reduction of 5.3 per cent from October and of 15.6 per cent from November 1930.

A TRIBUTE TO EBG INTEGRITY . . .

More than thirty-eight thousand chlorine container units . . . the largest number utilized by any single company in the industry . . . comprise the group at the EBG plant in Niagara Falls. This vastness is, in itself, a tribute to EBG integrity, an indication of the confidence placed in this organization's manufacturing and servicing methods. The list of those who specify EBG Liquid Chlorine is a long one.

The photograph shows a few of the thousands of Red EBG Liquid Chlorine cylinders.

Look for the RED Cylinder

ELECTRO BLEACHING GAS CO.

Pioneer Manufacturers of Liquid Chlorine

Main Office: 9 E. 41st St., New York, N. Y. Plant: Niagara Falls, N. Y.

EBG

Liquid Chlorine

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Alloy Steel in the Sulphite Industry*

By Andreas Christensen[1]

From the time of the introduction of the sulphite process into America up to the present date, manufacturers of sulphite pulp have never been confronted with problems of such magnitude as those facing the industry today. The fact that sulphite pulp enjoys the privilege of entering the United States free of duty, has placed our entire industry in a position where its very existence is depending upon our ability to meet foreign competition.

Paper producers who are making their own pulp are battling with the problem of either spending more money on their mills or charging off the entire investment and purchasing sulphite for their requirements. That the latter course is not an idle threat may be realized when we look at the situation in Northern Michigan and Wisconsin.

During the past eight years a total of ten sulphite mills have gone out of existence in this district alone, and in only one instance was the mill converted into making a different grade of pulp. Where a mill closes down and no other industry takes its place, the community suffers and a displacement of a large part of the population to other districts invariably follows.

For the paper mills that decide to continue making their own pulp there is only one alternative and that is to spend more money in plant improvements, making it possible to obtain the maximum yield from the wood, improve on the quality, and reduce the operating costs to a minimum. The sulphite mill that is making pulp for the market will either have to write off the entire investment or better its product and reduce its cost of operation sufficiently to be able to continue in business.

Application of Alloy Steel

In this paper I shall try to suggest means of making improvements in the digester department by taking full advantage of the possibilities offered us through the use of acid-resistant alloys in the chrome-nickel steel group. The departments closely allied to the digester department, namely, acid making, acid recovery, as well as blow pits, will also be dealt with.

Up till about three years ago this part of the sulphite mill had not progressed in the same proportion as other departments because of the lack of a construction material resistant to the highly corrosive effect of hot calcium bisulphite cooking acid.

The upkeep on auxiliary equipment installed to better operating conditions was usually so high that a saving often would be turned into a loss. For this reason the success of the process of digesting the wood by dissolving the lignin with calcium bisulphite liquor in digesters, at a given pressure and temperature, was in a large measure dependent upon the human element.

During the World War all of the warring nations were bending their efforts toward perfecting an alloy that would give longer service in rifle and gun barrels and also have greater strength as an armor. The result of this research was the introduction of chrome-nickel steel, which, through its great strength and rust and corrosion resisting qualities, is rapidly finding its way into every industry.

Of the different alloys introduced into the sulphite industry, belonging to this group, the one containing about 18 to 20 per cent chromium, 7 to 10 per cent nickel, with small quantities of manganese, silicon, and carbon, has probably found the widest application. Castings are used in sulphite mills today with a wide range of chromium and nickel content, from the extreme of 30 per cent chromium and 9 per cent nickel to 17 per cent chromium and 7 per cent nickel, with small quantities of manganese, silicon and carbon.

As to the relative value of any of these alloys, the writer has found that where only 17 to 18 per cent chromium is present, greater care must be taken in machining to avoid work hardening. By increasing the chromium content we are apparently getting away from the border line metal and have a safer alloy to work with.

Forced Circulation and Indirect Heating

The process of "cooking" sulphite pulp has not changed materially from the time of the introduction of the sulphite process in 1869 up to the present date.

Digesting of the wood in a hot solution of calcium bisulphite is usually accomplished in vertical digesters ranging in height from 30 to 65 feet. Owing to the great height of these vessels and because the steam for heating is always admitted at the bottom, there is a great deal of difference in conditions existing in the upper and lower parts of the digester, bringing about non-uniform quality of the pulp made.

With digesters 40 feet in height the pressure in the lower part is 17.5 pounds per square inch greater than at the top.

As the concentration of the active cooking agent, free SO_2, is in direct proportion to the pressure, the reaction is carried out at a much higher rate in the lower part of the digester. The resultant pulp is a mixture of over and under cooked fiber rather than a uniform mass. This handicap has always been recognized, but only since the introduction of chrome-nickel alloys that will withstand the highly corrosive effect of the cooking liquor has it been possible to install auxiliary equipment to aid in equalizing the temperature within the digester during the cook and consequently in equalizing the degree of chemical action.

While European mills have grasped the opportunity offered them to correct this trouble through the introduction of chrome-

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 15-18, 1932. Written discussion of this paper will be welcome and should be sent to J. D. Miller, chairman, TAPPI materials of construction committee, York Haven Paper Company, York Haven, Pa.

[1] Contribution of the TAPPI materials of construction committee.

[1] Member TAPPI, sulphite superintendent, Rhinelander Paper Company, Rhinelander, Wis.

nickel steel, and have installed auxiliary equipment for the forced circulation of the liquor during the cook, American mills have been slow in appreciating the importance of this new development. A survey made by the writer revealed that while more than 125 installations had been made on digesters in Scandinavian countries and Germany during the past two years, this development had hardly passed the experimental stage in America.

By circulating the cooking acid during the cook we have been successful in eliminating one variable from the process by insuring a uniform distribution of heat.

With the addition of a heat exchanger, placed in the circulating line, we are able to include indirect heating of the cooking acid and consequently eliminate the variations caused by the dilution of cooking liquor with condensate.

A lengthy discussion of the advantages of a system of this type would be superfluous. It can be readily seen that by the addition of this equipment, every sulphite mill will be placed in a position to produce a pulp equal in strength and more uniform than Mitscherlich sulphite.

Not only are we eliminating from the process all variable factors, except the variables encountered in the wood used, but we are materially increasing the yield and consequently reducing the operating costs.

The introduction of forced circulating and indirect heating equipment marks the greatest development in the sulphite industry since the process was first commercialized, and it is reasonably safe to predict that it will be universally adopted by the mills that intend to remain in business.

Indirect heating of the cooking acid not only improves the quality of the pulp but it also improves the operation of the boiler plant. The condensate may be returned to the boilers, reducing the amount of make-up water required and insuring a more favorable heat balance.

Relieving of the digester during the cook is almost entirely eliminated by this process and the relief consists mostly of dry gas taken off at the end of the cook. The heat lost at this point, therefore is almost negligible.

Automatic Control of Sulphite Digester

Calcium bisulphite liquor does not attack chrome-nickel alloys of the proper composition. Valves and fittings made from this material will function perfectly after years of constant use. The coating over and clogging up with scale, consisting of dissolved copper and lime, which is so common when using bronze fittings, does not appear with chrome-nickel fittings.

Several attempts have been made to install equipment on sulphite digesters to control automatically the process of cooking and to eliminate the uncertainties connected with hand control. These attempts, however, were all defeated owing to the unavailability of an alloy insoluble in the cooking acid.

With the corrosion troubles eliminated and a positive circulation attained, insuring a uniform distribution of heat, it should be possible to install time temperature control automatically admitting steam for heating according to a predetermined cooking curve.

Heat Saving Devices

Enormous quantities of heat go to waste in the average sulphite mill, both in acid plant, digester room, and blow pit room.

The bulk of our domestic sulphite tonnage is made in mills located far from the principal coal mining districts, and for this reason fuel is a big item, particularly during the winter months.

With indirect heating of the cooking acid the condensate might be profitably returned directly to the feed water heater and the number of B.t.u. lost in the digester relief will be reduced to a minimum.

To guard against the possibility of a leak in the heater, it is advisable to equip the condensate return lines with pH or conductivity meters that would immediately show acidity in the water.

The process of oxidizing sulphur to SO_2, generates sufficient heat to warrant the installation of a waste heat boiler at this point. Here low or high pressure steam may be generated to good advantage without interfering with the process of cooling the SO_2 gas. In the waste liquor from the blow pits we have a source capable of supplying an abundance of warm water for process work. The drain lines from the different pits may be connected with a heat exchanger, and the water used for cooling down the waste liquor can be controlled through a thermostat in such a manner that a fairly uniform temperature is maintained.

As the flow of hot water reclaimed in this manner is quite erratic it will be necessary to install a surge tank large enough to store the water recovered between blows.

To what extent it is profitable to carry the work of recovering heat in a sulphite mill depends entirely on local conditions. To determine the savings that may be effected it would be necessary to make a complete survey of the individual mill. The greater the daily output of pulp and the higher the cost of steam, the greater the returns that could be realized on the investment.

Initial Cost and Advantages of Alloy Steel Fittings

Two years ago the use of chrome-nickel fittings in the sulphite mill was discussed by the writer at the Corrosion Committee Meeting of the Technical Association. The experience gained during the past two years has clearly demonstrated that we were justified in standardizing on this metal wherever hot calcium bisulphite liquor, hot SO_2 gas, and waste liquor was handled. The loss of fiber in the waste liquor from the blow pits, has been reduced to a minimum by the use of perforated chrome-nickel drainer bottoms.

Control of the process of cooking has been improved by using strainers and relief valves made from this metal. The valves can always be depended upon to keep tight and strainers will not clog even after months of continuous service. Machinist, pipefitter, and millwright charges against the digester department have been reduced to a point where they are almost negligible.

Most of the fittings and tubing installed on the digester relief lines four years ago are still in use and give no indication of being worn out. The failures encountered were mostly on small fittings subjected to a considerable amount of machining, and in every instance the break occurred shortly after the fitting was placed in service.

From this experience I have every reason to believe that calcium bisulphite liquor has no corrosive effect on chrome-nickel alloys, provided the alloy is of the right composition and structure and a segregation of the metals has not taken place during the process of machining.

With more steel mills taking up the manufacture of chrome-nickel steel and with the machining of this metal becoming more general, we can expect a gradual decrease in the price of fittings. Even at the prices paid four years ago, when we first started to use chrome-nickel fittings on our digesters, we have found it a very profitable investment, considering that it has needed no further attention.

To give a comparative figure on the cost of chrome-nickel against bronze fittings, based on the cost per ton of pulp made, is impossible until we know the ultimate life of the former metal. Only in isolated cases has it been necessary to make replacements of alloy steel fittings and in every instance the failure appeared to be due to improper machining.

The savings due to improved operating conditions, increase in yield by the reduction of fiber losses, and better control of the cooking process, directly attributable to the use of chrome-nickel equipment, are difficult to estimate, but will by far exceed the equipment cost as a result of the longer life obtained from fittings made from this metal.

The introduction of chrome-nickel alloys will without a doubt bring about radical changes in the sulphite industry, particularly in those departments where new developments have been hampered by the lack of an alloy resistant to the corrosive effect of calcium bisulphite.

Effect of Volume of Fresh Air in Heat Test for Stability of Paper*

By P. F. Wehmer[1]

The accelerated aging test applied to high grade papers intended for record purposes consists in determining certain chemical values (acidity, copper number and alpha cellulose) and certain physical values (bursting, tearing and folding strength) of the paper before and also after "aging" it by baking for 72 hours in an oven at an elevated temperature (105 deg. C. was the temperature used in these experiments). As the chemical values are calculated to per cent by weight of dry cellulose in the paper, it is also necessary to determine moisture, ash and sizing materials (rosin, glue or starch) on the paper as received. The chemical values indicate the purity of the cellulose in the paper. The physical values indicate the strength of the paper.

The baking of the samples is usually done in one of the various types of laboratory oven, generally electrically heated with temperature control only, and with no control on the amount of fresh air in contact with the paper.

A series of tests was therefore made, using 4 types of paper ranging from all rag to all sulphite stock, to learn, if possible, whether variation of the access of fresh air during the test affected the results.

Tests and Test Methods

Four samples of paper, consisting of (1) 100 per cent rag ledger, (2) 50 per cent rag bond, (3) 25 per cent rag book paper,

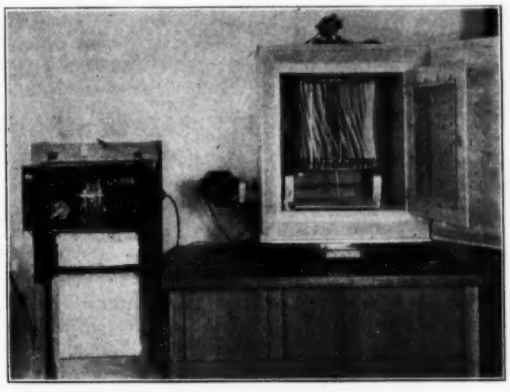


FIG. 1
Oven A

(4) 100 per cent sulphite bond, were purchased in the open market and used for the tests. Each sample was tested for the following:

1. Fiber Composition
2. Total Resins
3. Glue
4. Starch
5. Total Ash
6. Acidity
7. Copper Number
8. Alpha Cellulose
9. Bursting Strength
10. Folding Endurance
11. Tearing Strength

All chemical tests were made according to the published official paper testing methods of the Technical Association of the Pulp and Paper Industry. All physical tests were made at room conditions of 65 per cent relative humidity and 70 deg. F. Sufficient specimens of each sample were then baked for 72 hours at 105 deg. C. under three conditions of air access as follows:

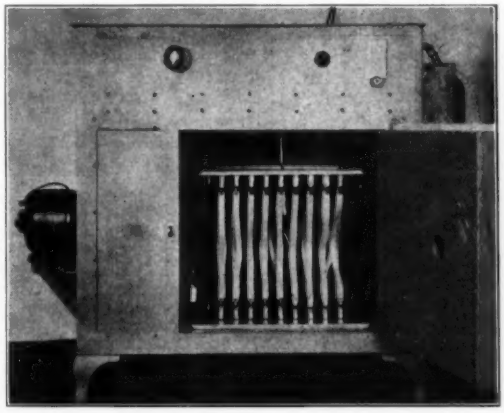


FIG. 2
Oven B

A. Oven having a circular opening 3/8-inch diameter at top and bottom and forced circulation of air within the oven by means of a small fan. (Fig. 1). A small amount of fresh air passed through this oven due to convection currents. This oven was selected as probably representing the usual method of baking.

B. Oven having positive, horizontal circulation of the air within it by means of a fan within the walls of the oven. During the baking both ports (each 2 in. diameter) were wide open. While the air velocity was not measured, it is known to be in excess of 50 cu. ft. per minute. (The manufacturer's estimate is approximately 200 cu. ft. per minute.) Fig. 2.

C. Same oven as used in B but with all ports closed tightly. As the door had a good seal, practically no fresh air had access to the specimens during baking.

Previous tests of the ovens used indicated very efficient uniformity of temperature distribution and control. (Maximum temperature difference 2 deg. C. and variation from setting not over 1 deg. C.)

The baked specimens were then tested for tests Nos. 6 to 11 inclusive.

RESULTS OF TESTS

A. SAMPLES AS RECEIVED				
Sample Mark	1	2	3	4
1. Fiber Composition				
Rag, per cent	100	50	25	....
Sulphite, per cent	...	50	75	100

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 15-18, 1932. This paper is published at this time to encourage a study of the problem presented. It will be discussed at the paper testing meeting and written discussion will be welcome. This should be sent to B. W. Scribner, chairman TAPPI, paper testing committee, Bureau of Standards, Washington, D. C.
Contribution of TAPPI, paper testing committee.

[1] Member TAPPI, chemist, Electrical Testing Laboratories, 80th Street and East End Avenue, New York, N. Y.

2. Total Resins, per cent by weight of oven dry paper (105 deg. C.)	0.14	1.44	1.96	1.27
3. Glue, per cent by weight of oven dry paper (105 deg. C.)	0.89	3.70	None	None
4. Starch, per cent by weight of oven dry paper (105 deg. C.)	None	1.00	None	0.77
5. Total Ash, per cent by weight of oven dry paper (105 deg. C.)	0.65	0.65	10.88	0.22
6. Acidity, Kohler-Hall method, per cent by weight of total cellulose	0.128	0.217	0.082	0.126
7. Copper Number, "corrected" to total cellulose	0.74	2.49	2.02	4.04
8. Alpha Cellulose, per cent by weight of total cellulose	92.1	84.6	85.7	77.6
9. Bursting Strength, Mullen tester, points, 10 tests				
Maximum	50	41	13	33
Minimum	46	37	10	25
Average	48	39	12	29
10. Folding Endurance, No. of double folds				
Machine direction, 5 tests				
Maximum	1995	755	17	185
Minimum	1615	475	9	93
Average	1760	610	12	123
Cross direction, 5 tests				
Maximum	1005	645	7	151
Minimum	635	405	5	55
Average	805	495	6	93
Average, both directions	1285	555	9	108
11. Tearing Strength, Elmendorf machine, grams				
Machine direction, 5 tests				
Maximum	132	80	48	62
Minimum	100	58	46	50
Average	118	66	48	57
Cross direction, 5 tests				
Maximum	124	72	40	60
Minimum	102	62	36	52
Average	114	66	38	56
Average, both directions	116	66	43	57

B. AFTER BAKING 72 hours at 105 deg. C.

Note: For convenience of comparison the "as received" test results are repeated here. All chemical test results are the averages of two determinations each.

	Before Baking	After Baking A	After Baking B	After Baking C
Sample No. 1 (100 per cent Rag Ledger)				
Acidity	0.128	0.138	0.151	0.152
Copper number	0.74	0.116	0.113	0.105
Alpha cellulose	92.1	91.4	91.4	91.0
Bursting Strength, Mullen tester, points, 10 tests				
Maximum	50	46	45	47
Minimum	46	40	42	44
Average	48	44	43	46
Folding Endurance				
Machine direction, 5 tests				
Maximum	1995	1810	2060	1585
Minimum	1615	915	755	890
Average	1760	1285	1345	1120
Cross direction, 5 tests				
Maximum	1005	700	485	525
Minimum	635	380	235	175
Average	805	545	315	355
Average, both directions	1285	915	830	740
Tearing Strength				
Machine direction, 5 tests				
Maximum	132	100	104	102
Minimum	100	92	96	96
Average	118	96	98	98
Cross direction, 5 tests				
Maximum	124	98	96	98
Minimum	102	88	86	90
Average	114	92	90	94
Average, both directions	116	94	94	96
Sample No. 2 (50 per cent Rag Bond)				
Acidity	0.217	0.276	0.271	0.300
Copper number	2.49	2.98	2.80	2.72
Alpha cellulose	84.6	83.0	83.1	82.8
Bursting Strength, Mullen tester, points, 10 tests				
Maximum	41	35	35	37
Minimum	37	31	32	33
Average	39	34	33	35
Folding Endurance				
Machine direction, 5 tests				
Maximum	755	93	55	66
Minimum	475	51	30	30
Average	610	71	44	46
Cross direction, 5 tests				
Maximum	645	145	150	110
Minimum	405	97	95	74
Average	495	118	113	89
Average, both directions	555	95	79	68
Tearing Strength				
Machine direction, 5 tests				
Maximum	80	52	54	52
Minimum	58	48	46	44
Average	66	52	50	48
Cross direction, 5 tests				
Maximum	72	56	50	50
Minimum	62	46	46	46
Average	66	50	48	48
Average, both directions	66	51	49	48
Sample No. 3 (25 per cent Rag Book)				
Acidity	0.082	0.112	0.139	0.131
Copper number	2.02	2.70	2.47	2.49
Alpha cellulose	85.7	84.4	84.2	84.5
Bursting Strength, Mullen tester, points, 10 tests				
Maximum	13	12	12	12
Minimum	10	10	10	10
Average	12	11	11	11
Folding Endurance				
Machine direction, 5 tests				
Maximum	17	8	8	8
Minimum	9	6	5	6
Average	12	7	6	7
Cross direction, 5 tests				
Maximum	7	5	5	6
Minimum	5	4	4	3
Average	6	5	4	4
Average, both directions	9	6	5	6
Tearing Strength				
Machine direction, 5 tests				
Maximum	48	48	40	44
Minimum	46	36	36	38
Average	48	42	38	42
Cross direction, 5 tests				
Maximum	40	38	38	38
Minimum	36	34	34	32
Average	43	36	36	36
Average, both directions	43	39	37	39
	Before Baking	After Baking A	After Baking B	After Baking C
Sample No. 4 (100 per cent Sulphite Bond)				
Acidity	0.126	0.133	0.128	0.130
Copper number	4.04	4.36	4.18	4.18
Alpha cellulose	77.6	70.1	69.8	70.3
Bursting Strength, Mullen tester, points, 10 tests				
Maximum	33	22	25	24
Minimum	25	18	23	20
Average	29	19	24	22
Folding Endurance				
Machine direction, 5 tests				
Maximum	185	1	4	1
Minimum	93	1	2	1
Average	123	1	3	1
Cross direction, 5 tests				
Maximum	151	2	7	2
Minimum	55	2	4	1
Average	93	2	5	2
Average, both directions	108	2	4	2
Tearing Strength				
Machine direction, 5 tests				
Maximum	62	28	38	34
Minimum	50	22	34	34
Average	57	24	36	34
Cross direction, 5 tests				
Maximum	60	28	30	28
Minimum	52	26	26	26
Average	56	26	28	26
Average, both directions	57	25	32	31

Conclusions

The results of these tests indicate that variations in the intake of fresh air are without significant effect upon the results of the heat test for stability of paper. Apparently any type of oven that maintains a constant temperature (plus or minus 2 deg. C.) uniformly distributed within the oven is satisfactory. The difference in chemical test results are probably all within the limit of error of test and the differences in physical test results are within the limit of variation of the paper itself. Also, humidity of the air probably has little effect. These tests were conducted during a period of low relative humidity, (not over 35 per cent), therefore the air in contact with the specimens during baking, having been heated to 105 deg. C. probably had a relative humidity of less than 2 per cent.

Accelerated Test for Paper

Research Paper No. 352 of the above title, published in the September issue of the bureau Journal of Research, reports the results of further study of accelerated aging treatments in testing the permanence of papers. A thorough study was made of the physical and chemical properties of a series of Government bond and ledger papers as well as of their behavior when exposed to various accelerated aging tests.

The results indicate the feasibility of classifying papers by means of suitable chemical, strength, and accelerated aging tests. The chemical tests include tests for fiber purity and non-cellulosic impurities such as acid and rosin used in sizing. The fiber purity, which is indicated by the alpha cellulose content and copper number, was found to bear an important relation to the stability of the papers. The accelerated aging test, which consists in exposing the papers to a temperature of 100° C. for 72 hours, and then determining the effect produced on the chemical and physical properties, appears to arrange the papers in about the same order of stability that would be expected on natural aging. A comparison of the results of the above-mentioned aging treatment with results obtained by using more nearly normal conditions (60° C. for 860 hours, and sunlight exposures) shows that they all classified the papers in much the same order of stability.

Shrinkage Reduced by Chlorination*

By Herman W. Richter[1]

All industries which handle hides or leather in the wet state are confronted with problems arising from bacterial action. Micro-organisms of many varieties find in leather an almost ideal nutrient medium, and under the favorable temperature and pH conditions obtaining in many manufacturing operations they thrive and multiply rapidly. Tanners find them valuable allies at certain stages of the tanning process; at other stages they find them desperate enemies which, if left unchecked, work havoc with the product. Whether or not good leather is made depends absolutely on the degree of bacterial control. An immense amount of unpublished work has been done by the laboratories connected with the tanning industry on the use of germicides and fungicides. Among the more important disinfectants commonly used by tanners are sodium fluoride, parachlormetacresol, alpha- and beta-naphthol, and, of course, chlorine.

Leatherboard mills have many of the problems of the tanner, but the difficulties are not so acute since the stock is in process for a shorter time. Nevertheless, it has been possible to show that a considerable portion of the large shrinkage losses suffered by leather board mills operating on an open system is directly traceable to the action of bacteria and molds. It has also been possible to reduce materially the shrinkage due to such action. Since the problem which confronts the leatherboard producer is simply an exaggerated picture of that which is found in every paper mill, it is believed that our experiences may be of some general interest to the industry.

Prior to the establishment of its laboratory, the George O. Jenkins Company, recognizing that the problem of shrinkage was, in part at least, a bacteriological one, made various attempts at control. This organization was one of the first in the paper industry to employ chlorine, but because of the difficulties peculiar to this specialized branch of board manufacture did not at once reap the full benefits of chlorination. To one familiar with the difficulties referred to it is not wholly clear why any benefits at all should have been obtained from the early attempts at bacterial control, but it is nevertheless true that these attempts, inefficient though they questionably were, did produce results of sufficient importance to warrant the continuation of chlorination.

In order to make clear the difficulties just mentioned, a short outline of the process of leatherboard manufacture is in order. Scrap leather, consisting mainly of cuttings from the shoe industry, is the major portion of the furnish, a small percentage of paper being used, largely for mechanical reasons. The leather portion of the furnish is composed partly of sole leather, partly of soft skivings, all of this material being vegetable-tanned stock. Sole leather is "stuffed" in process of manufacture with various materials such as glucose, Glauber's salt, sulphonated oils, etc., which impart certain desirable properties to the product. These chemicals, together with soluble tannins and colloidal matter, are largely leached out during the defibering process in the beater. Losses due to these solubles are very high, concentrations of such materials running as high as 150 pounds per thousand gallons in the beater.

Shrinkage Control

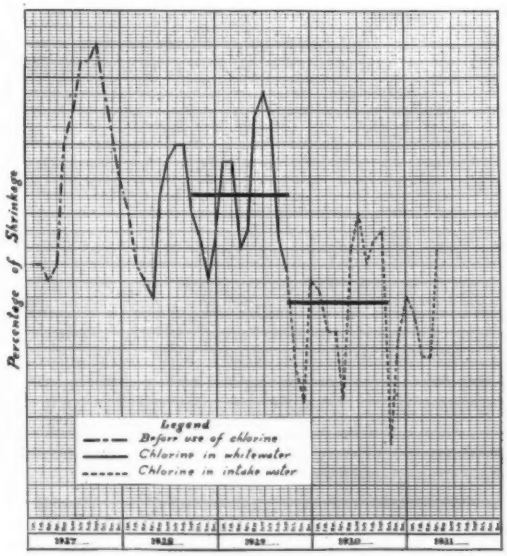
At a fairly remote period in the history of shrinkage control the whitewater was passed through Bird savealls. It is no discredit to these efficient machines that they failed to function satisfactorily. The slime problem at that time was so serious that no saveall could have given satisfaction. Spouts and pipe lines filled rapidly, frequent comprehensive cleanups were necessary, and the savealls clogged up with discouraging regularity. They were finally discarded.

The next step was the installation of a large Dorr saveall which, of course, gave much better results in the matter of fiber recovery, but failed to reduce soluble losses to any appreciable extent. While it is true that a small portion of the soluble material is converted into insoluble form during its passage through the Dorr, the bulk of it necessarily goes downstream. Fiber losses pale into insignificance in comparison with soluble losses in the leatherboard industry. The latter are never less than ten times as great as the former and may on occasion be twenty times as great.

Shrinkage graphs, carefully plotted over a period of years by the accounting staff, provided an important clue which was not overlooked by the management. These graphs brought out very clearly the fact that high losses were coincidental with greatest slime trouble. Shrinkage and slime trouble were always at a minimum during the cold months. In the early spring they started to increase, reaching a maximum during the months of greatest biological activity, June and July. Then they tapered off again to the midwinter lows. The picture was at times marred, as it still is, by differences in soluble content of the leather used, but the general trend was unmistakable and the cause of shrinkage fluctuations obvious.[2]

Chlorine Application

At about this juncture, chlorine was being actively studied by the industry as a means of slime control. A Wallace & Tiernan



* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 15-18, 1932. Written discussion will be welcome and should be sent to C. M. Baker, American Paper and Pulp Association, 2 South Carroll St., Madison, Wis.
Contribution of the TAPPI waste committee.

[1] Assoc. member TAPPI, director of research, George O. Jenkins Company, Bridgewater, Mass.

[2] Somewhat analogous observations were made by Keefer in the case of biochemical oxygen demand value of sewage and by Tiedeman in the case of chlorine demand of sewage, their graphs closely paralleling our shrinkage graph. The references follow:
"Bio-Chemical Oxygen Demand of Raw and Treated Sewage," C. E. Keefer, R. T. Regester, Engineering News-Record, 97, 870-3 (1926).
"Efficiency of Chlorinating Sewage Tank Effluents," W. V. P. Tiedeman, Engineering News-Record, 98, 944-8 (1927).

outfit was installed in the mill and various points of application were tried. Part of the clarified whitewater is used as beater make-up and chlorine was first introduced into this line. Since, however, this water was only used intermittently, chlorine built up to relatively high concentrations, the odor was strong throughout the mill when the beaters were being loaded. This method was shortly abondoned.

The next point of application was in the intake of fresh water used for showers. As no chemist was then employed, there was no adequate control, and it was found that felt life was seriously affected. The quantities of gas used were all out of line and might have caused serious damage to machinery and stock had it not been for the strongly reducing character of the solubles, which have such an enormous chlorine demand that free chlorine, even in large amounts, is promptly used up.

The third point of application was in the whitewater on its way to the Dorr saveall. This was the method in use at the time the laboratory was installed.

It was, of course, obvious that no study of chlorination could succeed without accurate means for measuring residual chlorine. At that time the handy little Wallace & Tiernan block comparator was not available. A set of standards for use with orthotolidin was prepared according to the specifications laid down by Enslow,[3] and used with good success in a modified La Motte block comparator. It was promptly discovered that even with the relatively large amounts of gas then being employed, no free chlorine could be found in the treated whitewater. Simple tests showed that the addition of chlorine water to whitewater produced an immediate deepening of color accompanied by a complete disappearance of chlorine odor. Accordingly, the chlorine demand of the whitewater was determined and found to be slightly under 200 parts per million. This value, of course, may be expected to vary with the furnish.

Bacterial Counts

During the period covered by these activities a careful bacteriological study was also in progress. Bacterial counts were made on raw material, on stock at various stages of manufacture, and on incoming and carrying water. These counts showed that certain types of stock were rather highly contaminated with mold spores, but that other types were, for all practical purposes, sterile. Rapid increase of micro-organisms was found to occur during the beating process with its accompanying rise of temperature from about 20 to 40 deg. C., a most favorable range for incubation.[4] There was also an increase, during the week, in the bacterial count of the clarified whitewater used as beater furnish. This increase could have been prevented by applying chlorine to the complete satisfaction of the chlorine demand, but this would have called for an excessive amount of gas, and when tried for short periods was found to result in a product of inferior quality. As was mentioned earlier in this paper, chlorination of the whitewater, inefficient though it was as compared to the present method, produced results of sufficient importance to warrant its continuation. Cleanups were less frequent and shrinkage appeared to be appreciably reduced, the effect being particularly noticeable during the hot months. This experience is not unique, since a large container board mill is credibly reported to have been able to reduce cleanups fifty per cent, even though unable to maintain residual chlorine. Furthermore, Enslow states, in the publication previously referred to, that a minor dosage of chlorine (about one-third that necessary to satisfy the chlorine demand) is all that is necessary to stay hydrolysis and septic action in a highly organic and putrefiable substance such as packing house wastes.

As a result of the bacteriological investigations, it was at first assumed that the highly contaminated stock was responsible for the slime trouble and high shrinkage losses experienced, but later considerations led to the belief that the river water might be the source of the trouble. Sewage is dumped into the stream at a point not much over a mile above the mill. This, taken in conjunction with the facts that the amount of contaminated material used in the furnish is relatively small, that the fresh water used is very large in amount, and that this water had been shown to have a fairly high count, one count showing six hundred colonies per cubic centimeter, led to a shift in the attack. The chlorine was again applied to the incoming water used for showers and careful control was instituted to prevent felt damage, a residual of 0.2 p.p.m. being maintained. Samples of river water were now taken at a point on the stream above the entrance of sewage and at the mill before and after chlorination. The results are given in the following table.

Point of Sampling	Total Colonies per 1 c.c.	Acid Formers	B. Coli
Above sewage entrance	160	8	Absent
Mill, before chlorination	155	31	Present
Mill, after chlorination	4	0	Absent

This table clearly shows the contamination introduced by the sewage and the great efficiency of chlorination.

Even more striking, however, is the evidence furnished by the shrinkage graph, which is here reproduced. The heavy bars appearing on this chart represent corresponding twelve month averages under different conditions of chlorination, and the spread between them represents the saving attributable to the new technique. Reasons which will readily be understood make it impossible for the writer to give actual percentage values, but the qualitative statement made by the chart is sufficient to indicate the considerable saving effected.

It will be noted that seasonal fluctuations still occur, pointing to the fact that the problem is still far from complete solution. Our organization, during the period covered by this report, has had under way several developments of major importance which have prevented close attention to the waste problem. Better results could unquestionably have been obtained by systematic and rigid control. It is our intention to pursue these studies, when opportunity is afforded, to their ultimate conclusion: the complete elimination of losses due to biological activity.

Chlorine and Mill Operating Problems

Certain questions relating to operating problems will undoubtedly suggest themselves, and I shall endeavor to anticipate some of them in the following brief statements of facts.

Felt life under controlled chlorination is no longer a troublesome problem. It is never heard from so long as residuals are carefully watched, but it does not take long to get a reaction from the mill if the laboratory gets careless!

Cleanups are far less frequent than under former operating conditions. Chlorine certainly does kill slime. If residuals are allowed to run too high, the operating force soon becomes aware of the condition because beater-valves are so thoroughly freed of slime that they start to leak. If chlorine is cut off entirely under such conditions, it usually takes about three days in summer for enough slime to accumulate to make the valves tight again.

There is considerable evidence to show that wet-machine production is cut down materially when the chlorine supply is cut off for any length of time.

The chlorine demand of our river water is greatest during periods of low water and drops rapidly when sudden rainstorms cause the river to rise quickly. The fact that the river is always high in winter and usually low in summer undoubtedly has a bearing on the problem.

Summary

Controlled chlorination of intake water has provided a partial answer to the shrinkage problem in one leatherboard mill.

It has, in addition, resulted in important economies through slime reduction and increased machine production.

Felt life is not adversely affected if residual chlorine is carefully controlled.

[3] "Recent Developments in Sewage Chlorination," a publication (1926) of the Chlorine Institute, Inc., 30 E. 42nd St., New York City.

[4] It is interesting to note that tanners have observed a similar result during the "paddling" of hides, a process which involves a temperature rise comparable to that observed in the beating process.

Alloy Cast Iron for Use in the Paper Industry*

By J. S. Vanick[1] and F. L. LaQue[1]

The purpose of this paper is to place before mill operators the progress achieved by foundrymen serving the paper industry so that the industry may make use of the foundryman's achievements to reduce its maintenance expenses, improve its products, increase the speed and precision of manufacture, and simultaneously strive to attain in the mill, that awesome, confident appearance of cleanliness and orderliness which is so characteristic of the modern power house.

Corrosion, heat and wear are the principal factors active in the deterioration of cast iron in the paper mill, while secondary factors such as strength, stiffness, thermal conductivity, grain, density, and the ability to take a fine finish or polish influence the operation of mill equipment.

Some attention has been given to cast iron parts in the logging and timber dressing ends of the industry chiefly in the direction of increasing the strength and resistance to wear or mildly improving the resistance to corrosion of some of the equipment almost continually flooded with fresh but slightly corrosive water —in a few cases, sea water.

It is proposed to consider the possible improvement of cast iron as it is used in various parts of paper mill equipment by drawing attention to data pertaining directly to the industry as well as to information obtained from both test and experience in similar service.

The arrangement of the text follows the sequence of operations from raw to finished product as closely as possible.

The Acid Plant

The combustion of sulphur to form sulphur dioxide is a relatively harmless operation insofar as it effects the hot zones of the gas lines and manifolds. Usually cast iron of the type used in cast pipe compositions is used. Mild additions of alloys of the order of .15 to .40 per cent nickel with .15 to .30 per cent chromium have occasionally been used to retard deterioration from growth, heat and corrosion. In a few cases, more effective measures have been taken in this direction by increasing the alloy content to as much as .60 to 1.25 per cent nickel and .30 to .60 per cent chromium. An example of what may be expected of alloy additions of this magnitude upon the thermal stability of a cast iron and consequently upon its resistance to structural decay is shown in the following table:

EFFECT OF NICKEL ON THE THERMAL STABILITY OF CAST IRON

	TC	Si	Ni	Cr	Combined Carbon: As cast	Combined Carbon: After 90 hrs. at 1200° F.	Combined Carbon: % of original
Plain	3.10	1.69	...	...	.79	.09	11.5
Ni-Cr	3.15	1.76	1.13	.45	.90	.41	56.5

The usual pipe composition and suggested modifications follow:

	TC	Si	Ni	Cr
Usual	3.10-3.40	1.70-2.40	.....	.....
Mild Ni-Cr	3.10-3.40	1.70-2.40	.15-.40	.10-.30
Strong Ni-Cr	3.10-3.40	1.70-2.40	.60-1.25	.30-.60

The change in combined carbon shown in the table above is a measure of the "growth" and of the progress of decomposition of the cast irons. The moderate additions of nickel and chromium recommended are considered to be adequate for the hot sections of the sulphur dioxide lines. Ni-Resist, a cast iron containing 14 per cent nickel, 6 per cent copper, and about 2 per cent chromium is very much superior in resistance to growth, decomposition by heat, and corrosion than the low alloy types of iron but its superior properties are not felt to be required at this point. This newly developed alloyed cast iron is known by the registered trade name, "Ni-Resist." Its composition follows: Total carbon 2.75-3.10, silicon 1.00-2.00, nickel 12.00-15.00, copper 5.00-7.00, chromium 1.25-4.00, manganese 1.00-1.50, sulphur .04-.12, and phosphorus .04-.30. The name, "Ni-Resist" is a compact abbreviation of nickel-corrosion-resisting-cast iron, used to distinguish this special cast iron from other cast iron. It is readily machinable within the range of compositions specified, with chromium in excess of 3 per cent, the speed of machining is decreased.

Corrosion, including sulphidization and oxidation, is more destructive to cast iron in the burner lines than the purely thermal effect discussed above.

Preliminary tests upon samples of cast iron exposed to the hot fumes of the burner lines show that a gain in weight occurs due to the building up of corrosion products which mask the rate of deterioration of the mildly alloyed irons. The effects of the alloys become more pronounced in long exposures and a truer measure of the deterioration rate is obtained by removing the corrosion film. A short exposure of about two months in an intermittently operated burner yielded the following results. The specimens were installed at a point where the temperature reached about 950 deg. F.

Type	TC	Si	Ni	Cu	Cr	Average Gain in Weight Duplicate Samples
Plain	3.14	1.51	none	none	none	7.0 grams
Ni-Resist	3.23	1.54	13.44	5.84	3.85	2.5 grams

These data clearly show that substantial improvements in the life of the hot lines of the SO_2 cooling line can be obtained by means of the Ni-Resist compositions.

As the gas cools further, and becomes wet because of condensation, corrosion becomes the major destructive agent. Cast pipe, ½ inch thick, requires too frequent replacement in this portion of the cooling system, and the frequency of repairs has compelled a design with accessibility an important factor. Small additions of alloys yield a correspondingly mild improvement. The corrosion is drastic—and correspondingly large additions of alloys are necessary to obtain a satisfactory performance from cast iron. In the absence of adequate data on the corrosion of cast iron by moist sulphur dioxide, we are drawing upon experience with moist hydrogen sulphide which exerts similar corrosive effects. The following results of tests in moist hydrogen sulphide indicate that alloy additions are beneficial.

RESULTS OF TESTS IN HYDROGEN SULPHIDE AND STEAM AT 200 DEG. F.

	TC	Si	Ni	Cu	Cr	Mg. per Sq. Dm. per Day: 1 day average Gain	1 day average Loss*	1 week average Gain	1 week average Loss*
Plain Iron	3.59	2.12	none	none	none	166	319	442	397
Ni-Resist	2.84	1.70	13.91	5.23	1.57	49.7	99	254	156
Ni-Resist	3.06	1.57	14.13	5.25	2.64	43.4	71	201	115
Ni-Resist	2.86	1.72	14.31	5.37	3.89	42.0	59	186	64

* After removing adhering sulphides and oxides.

The usefulness of Ni-Resist for valve, pump and compressor parts exposed to oil vapor with sulphur gases containing moisture has been demonstrated in petroleum refining and considerable quantities are now in use. A recent 275-hour test at the York Haven Paper Co. of Ni-Resist with other cast irons in the cooling lines of the acid plant yielded the following results.

RESULTS OF TESTS IN GAS CONTAINING 14.5 PER CENT SULPHUR DIOXIDE AT 400 DEG. F.

Type	TC	Si	Ni	Cu	Cr	Loss in mg./dm.²/day
Plain	3.41	1.99	....	...	...	13.8
Ni-Cr.	3.29	2.73	2.71	0	.76	11.2
Ni-Resist	2.92	1.52	14.62	6.38	2.03	6.9

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 15-18, 1932. Written discussion of this paper is welcome and should be sent to J. D. Miller, York Haven Paper Co., York Haven, Pa.

Contribution of the TAPPI materials of construction committee.

[1] Research and Development Department, International Nickel Company, Inc., New York, N. Y. (TAPPI Contributing Member).

It is evident that the duration of the above tests was much too short and furthermore the results of weight loss determinations may not indicate the relative degree of destruction because failure frequently occurs as a result of seepage of gas through the pipe walls. The tests are being continued for a longer period after which the specimens will be examined microscopically as well as by determinations of weight loss.

Sulphite Digesters

There are no data to indicate that either plain or alloyed cast iron would be useful for handling either sulphurous acid or calcium bisulphite prior to their use in the digesters. A large number of tests on Ni-Resist exposed to digester liquors in several paper mills yielded results which were in very poor agreement and in general indicated that Ni-Resist had little chance to compete with the chromium-nickel stainless type steels. In certain cases it was shown to be superior to common bronzes and in others inferior. No effort should be made to apply cast iron to the digester or any of its pressure lines because it lacks the toughness which a material under alternating stress and high pressures requires.

Since some of the tests made with samples of the higher chromium type of Ni-Resist exposed within digesters as shown in the following table indicated that it possessed fair resistance to corrosion as compared with bronze, it is reasonable to expect that its superiority over plain cast iron for handling spent sulphite liquor should justify its use.

RESULTS OF TESTS IN SULPHITE DIGESTER

Material	Rates of Corrosion in Mg. per Sq. Dm. per Day
88-10-2 Bronze	1476
Ni-Resist 3% Cr	1752
Ni-Resist 6% Cr	576
18-8 Cr-Ni-Fe	0

Sulphate and Soda Processes

In the sulphate and soda processes the problem becomes one largely of securing resistance to corrosion by caustic soda or mixtures of caustic soda and sodium sulphide. The well known use of pure nickel and Monel Metal in the manufacture of highly concentrated caustic and in black liquor evaporators has led to the extensive use of nickel as an alloy in cast iron where the size or nature of the equipment compels its use. It is possible to effect a mild improvement in resistance to corrosion by caustic by using not more than 3 per cent of nickel. Larger amounts of nickel, over 3 per cent, continue to be effective insofar as corrosion is concerned, but their hardening effect in the range of 3 to 15 per cent prevents their commercial production because of poor machinability. Above 15 per cent nickel a softening effect occurs which restores the machinability and this, combined with the distinctive resistance to corrosion, finds its commercial expression in the Ni-Resist containing approximately 14 per cent nickel, 6 per cent copper, 2 per cent chromium which can be produced at a relatively low cost, or its copper free modification mentioned below.

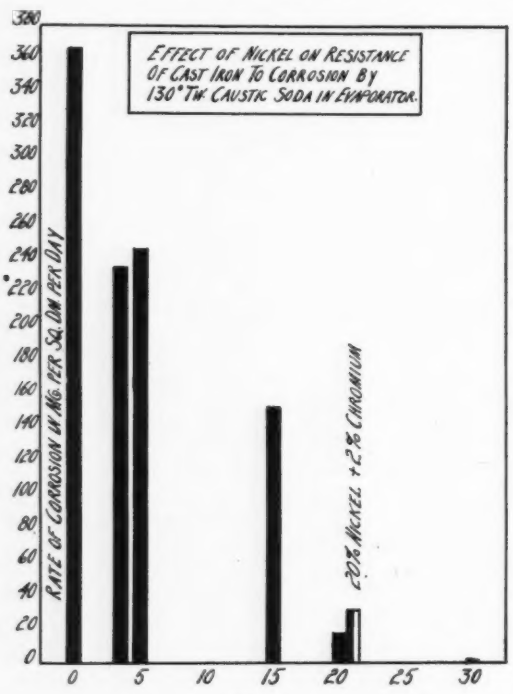


FIG. 1

Nickel Content of Iron in Per Cent.

The effect of nickel in improving the resistance of iron to corrosion by caustic is shown by the following table and in Fig. I covering results of tests in a caustic soda evaporator used in the manufacture of caustic. Obviously iron for such parts as pipe, valves, pumps, etc., ordinarily made of cast iron can be mildly improved by small additions of nickel or very much improved from the corrosion standpoint by making it of the Ni-Resist composition.

RATES OF CORROSION OF NICKEL CAST IRON IN 130° Tw. CAUSTIC AT THE BOILING POINT

No.	T.C.	Si	Ni	Cr	Loss in weight in mg. per sq. dm. per day
1	3.66	0.97	none	none	366
2	3.03	1.11	3.77	none	235
3	2.88	0.75	6.53	none	247
4	2.73	0.60	16.66	none	152
5	2.67	0.65	19.55	1.80	31
6	2.13	0.51	22.24	none	17
7	2.27	0.61	28.90	none	2

RECOMMENDED COMPOSITIONS

	T.C.	Si	Ni	Cr	Cu
Copper free Ni-Resist	2.80-3.10	.80-1.40	18-22	2-4	..
Regular Ni-Resist	2.80-3.10	1.25-2.00	12.15	2-3.5	5-7

The 20 per cent nickel type is recommended where freedom from copper contamination is important. As a rule the regular Ni-Resist is somewhat less expensive.

Paper Stock and White Water

Washed pulp and white water are usually moved around the mill by cast iron pumps, the flow being regulated by cast iron valves and the destination directed by pipe lines made of steel, wrought iron, wood, cast iron and in some cases by corrosion resisting metals of the copper or Monel type. Corrosion is a direct factor in this application and, while the corrosive is so mild that the equipment would last for an adequate period, contamination and discoloration of the pulp occur, which often cause considerable annoyance. Rusting and tuberculation which occur in the iron base materials can be practically eliminated by the use of Ni-Resist pumps, valves, plug cocks and pipe lines, or appreciably reduced by small additions of nickel. The following data illustrate the improved resistance of alloyed cast iron to fresh water corrosion, the presence of small amounts of acids would accentuate the improvement particularly in the case of Ni-Resist.

CORROSION IN FRESH WATER

Type	TC	Si	Ni	Cr	Cu	Corrosion in mg./sq. dm./day: Aerated tap water	Vertical spray	Horizontal spray
Plain	3.30	2.0	...	..	..	67	207	244
Ni-Resist*	3.0	1.4	14.0	2.0	5.5	8	7	18

Tests below by Massachusetts Institute of Technology (B. E. Rotheli)

						mg./sq. dm./day	Remarks
Low Silicon	3.55	1.20	.62	..	..	62	After 150 days
High Silicon	3.20	2.25	.75	..	..	63	exposure to
5% Ni	3.46	1.46	4.78	..	..	42	aerated, run-
Ni-Cr*	3.20	2.25	1.0	.40	..	57	ning tap water.
Ni-Resist*	3.0	1.40	14.0	2.0	5.50	10	

* Approximate composition.

Data on the resistance of Ni-Resist to corrosion by sulphite stock as it entered a filter are given in the table below:

CORROSION OF METALS IN SULPHITE STOCK ENTERING A FILTER

Metal	Rate of Corrosion: In mg./ sq. dm./day	Rate of Corrosion: In inches pene./yr.
Bronze	0.5	0.0001
Ni-Resist	1.7	0.0003

It will be noted that Ni-Resist was slightly inferior to the bronze, but the rates of corrosion for both materials were so small that the difference had no practical significance. It is quite evident that Ni-Resist should be quite suitable for equipment used in the handling of paper stock.

Suggestions made with respect to the stock lines apply as well to cast iron portions of the paper machine such as the suction box, now partly protected by paints or metallic coatings. At this point, mention might be made of sea-water corrosion encountered in plants compelled to use it or brackish water in their operations.

CORROSION IN SEA, OR BRACKISH WATER

Source	Description	Inches Penetration/yr.: Ni-Resist	Inches Penetration/yr.: Cast Iron
1	3% Aerated sodium chloride	.01	.04
2	Harbor water slightly acid & salt at pump	.055	.168
2	Harbor water slightly acid & salt at 150° F.	.057	.118
2	Harbor water more acid & salt at 150° F.	.068	.262
		% Weight Loss	
3	Navy standard salt spray test	.067	.791
		Ratio of Weight Loss	
4	Sea water immersion	1	5.0
4	Salt spray (20%) salt	1	2.9

Bleach Liquor Corrosion

Corrosion of metals by the highly corrosive solutions containing free chlorine, encountered in the bleach plant, is always troublesome. It seems that ordinary cast iron and wrought iron are most frequently used for handling bleach liquors, especially those made up from calcium hypochlorite, from which calcium carbonate precipitates and forms a protective coating on the metal.

It is difficult to obtain accurate information on the resistance of metals to corrosion by means of plant tests in bleach liquors, since protective coatings form on all the samples and prevent further corrosion. For example, a sample of Ni-Resist exposed to bleach containing 29 grams per liter of available chlorine, in a flow box, for over two months acquired a thick coating of carbonate which protected it almost completely from corrosion, as shown by examination of the metal when the deposit was scraped off.

It is difficult to determine the resistance of metals to corrosion by hypochlorites by means of laboratory tests since the available chlorine content of the test solution, and, therefore, its corrosiveness, decreases fairly rapidly. However, the following results of a 39-day test in a sample of beach liquor containing originally 23 grams per liter of available chlorine may be interesting as indicating roughly the relative merits of the different types of iron.

CORROSION IN BLEACH LIQUOR

Type	Analysis: TC	Si	Ni	Cr	Cu	Corrosion Rate in: In mg./ sq. dm./day	Corrosion Rate in: In. pene./yr.
Ni-Resist	3.11	1.51	13.70	2.32	6.06	41	0.0007
Ni-Cr	3.29	2.73	2.71	0.76	...	92	0.016
Plain	3.41	1.99	....	...	...	105	0.018

Of course the corrosion rates shown in the above test are much less than would be obtained in solutions whose content of available chlorine would remain fairly constant. Tests made by exposing samples for five days in a plant to a solution containing on the average 22.5 grams per liter of available chlorine showed that the corrosion rates would probably be from 10 to 20 times the rates shown by the laboratory test. In these plant tests the Ni-Resist samples were least attacked though it was difficult to obtain quantitative results, due to the nature of the corrosion products which formed on the various specimens and which were removed either wholly or partially before reweighing the specimens. It suffices to say that after the plant tests, the Ni-Resist specimens were sounder, more uniformly corroded and had suffered less localized attack than the lower alloyed and unalloyed irons. In view of the prejudice against copper alloys in bleach plants, a copper-free Ni-Resist, of approximately the following composition: TC 2.70-3.10, Si .80 to 1.50, Ni 18—22%, Cr 2—3.50% might be more desirable. It is conceivable that a less highly alloyed composition would be more economical for use in bleach plants, for such equipment as piping, fittings, plug cocks, pumps, etc.

The use of alum in the treatment of pulp introduces corrosion by that chemical. The relative resistance of plain iron, steel and Ni-Resist are indicated by the results of tests in a 10 per cent alum solution at 150 deg. F. which showed that Ni-Resist was 15 times more resistant than plain iron and about 10 times better than steel.

Paper Machine Parts

Drier rolls, drier heads, gears, clutch plates and calendar rolls are outstanding examples of the remaining portions of the mill employing cast iron with which considerable progress has been made, of advantage to the mill operator.

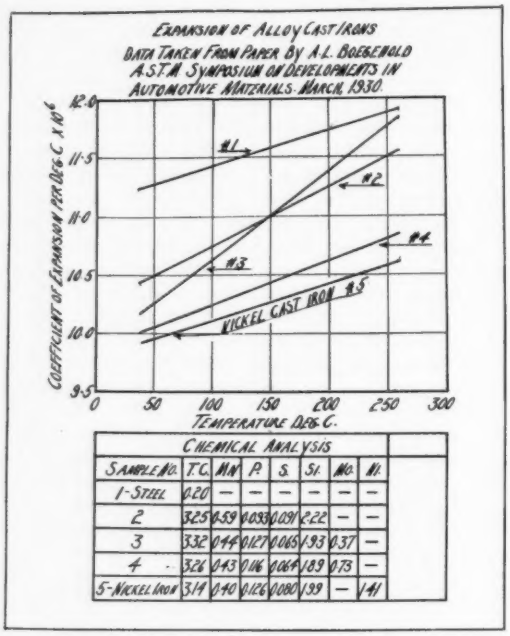
Drier rolls afford an ample opportunity for improvement. It is common practice in their production to employ special molding equipment and skillful labor in developing clean, smooth and sound castings.

Cast iron mixtures used in driers have not kept up with the advance in skill and mechanical equipment. In numerous special cases, the addition of nickel and chromium, to the extent of .60 per cent nickel and .40 per cent chromium to the usual roll mixture has produced a marked improvement. In other cases, the improvement is accomplished by a radical change in the roll mixture accompanied by small additions of nickel of the order of 1 per cent, to develop the desired density, maintain machinability and to achieve a smooth finish, or even a polish, while contributing desirable secondary effects such as increased and better conductivity, strength, stiffness and hardness. It is obviously desirable to improve the contact between stock and metal to increase drying efficiency, and avoid injury to the sheet. Polishing, initially or in service, accomplishes this and a dense, slightly harder type of cast iron is essential to easy polishing. It must be free from either hard roughening inclusions or porosity caused by too many graphitic pits or clusters of them, commonly referred to as "openness of grain". Rolls which are clad with fabricated sheet metals can obviously be made free of pits or hard spots. The corresponding achievement in the solid casting requires careful attention to the cupola and molding. Incidentally, the harder, stronger grades of cast iron possess, in general, greater stiffness, a very important factor in reducing the sag, whip and camber in the long rolls now becoming increasingly common in the modern paper mill. A common mixture and final compostion for drier rolls, closely resembling the type frequently used in locomotive cylinder production which approximates the drier roll in weight and quantity of metal required, follows:

Mixture: 60% Steel, 20% Returns, 20% High Si pig, ¾-1¼% Nickel.
Analysis: TC 2.90-3.30, Si .90-1.25, P under .30, S under .12, Mn under .90, Ni .90-1.25%.

Drier heads require close grained, pressure tight, high strength irons to do their work best. Their trunions frequently carry a

1. From International Nickel Co., Bulletin 208.
2. From Petroleum Industry Applies Low Cost, Corrosion Resisting Cast Iron. INCO—vol. X—No. 4—P. 15, 1931.
3. Ingersoll Rand Co. (International Nickel Co. Bulletin 208).
4. From "Revue de Metallurgie"—Oct. 1929—by M. Ballay—"Recherches sur quelques fontes au Nickel et au cuivre."



CHEMICAL ANALYSIS							
SAMPLE NO.	TC.	MN.	P.	S.	SI.	MO.	NI.
1-STEEL	0.20	—	—	—	—	—	—
2	3.25	0.59	0.038	0.091	2.22	—	—
3	3.32	0.44	0.127	0.065	1.93	0.37	—
4	3.26	0.43	0.116	0.064	1.89	0.73	—
5-NICKEL IRON	3.14	0.40	0.126	0.080	1.99	—	1.41

FIG. 2

heavy load, and are subjected to high speed alternating stresses easily leading to fatigue failures. In the colder northern climates the alternating thermal stress set up in heating and cooling is also an important factor leading to the fatigue type of cracking. The obvious course to take in reducing these risks is to develop high strength, low distortion types of iron. The 2 per cent nickel, high-strength type, patterned after the drier roll mixture is usually adequate, but for more severe service, a still higher steel mixture such as the following, made in the proper way, is better.

Typical Mixture: 60 to 70% steel, 20 to 30% high Si pig, 0 to 10% returns, 1% Fe 80 Mn (or equiv. manganese), 1% Fe 80% Si, 2% F. Nickel.
Typical Analysis: 2.80-3.10 TC, 1.40-1.85 Si, 1.50-2.0 Ni, .60-.80 Mn, P & S low.
Tensile Properties 45,000 to 60,000 pounds per square inch.
Transverse—1¼ inch bar, 4500 to 6500 lbs.
Brinell—1¼ inch bar, 190 to 250.

Fatigue strength in cast iron, is roughly proportional to the tensile strength. Fatigue strength limits are about 50 per cent of the ultimate strength. Obviously higher ultimate strengths mean better fatigue resistance. A low temperature (750 to 1000 deg. F.) stress relief anneal of castings of this type should contribute much toward improving their subsequent performance. The lower thermal expansion of the nickel cast iron type of composition (Fig. 2) found useful in automotive engine castings should be no less useful in avoiding excessive thermal fatigue in the heavily loaded drier head subjected to temperatures from below freezing to operating temperatures.

Calender rolls, like the driers, can be improved in stiffness and strength. Good surface and considerable hardness are also essential. Usually chilled iron similar to the railroad chilled car wheel in composition is employed in calender roll castings. Moderate additions of nickel chromium and at times molybdenum, increase the strength, stiffness and hardness, for example:

	Plain	Alloy	
TC	3.30-3.50	3.30-3.50	
Si	.50- .90	.50-1.10	
Ni	.....	2½-3½	
Cr	.05- .10	.75-1.10	
Mo	.....	.20- .35	
Core strength	18,000	35,000	pounds per square inch
Surface hardness	380-430	500-600	Brinell hardness number

Cast iron similar in composition to the alloy type shown in the above table is common in rolls and dies for metal working purposes. Greater resistance to wear and to troublesome flattening or "wash board" effect can undoubtedly be achieved by applying the alloy type of composition. By using still larger additions of alloys than shown above, surface hardness in excesses of 650 Brinell can be obtained. Experiments in this direction are in progress abroad under the stimulation of a demand for better calender rolls.

Gears, sprockets, clutch plates and similar miscellaneous castings frequently replaced in mill operations, require hardness along with machinability, and strength. Usually made from ordinary "machinery iron", they can be markedly improved through the use of alloy additions of the order of 1¼-1½ per cent nickel with .30 to .60 chromium. Better still, the high test type of iron described for drier heads above, contributes strength in addition to the resistance to wear.

Many other minor but important castings are open to improvement as the nature of their weakness becomes known and appropriate reinforcements in corrosion resistance, wear resistance, stiffness, strength and hardness are applied.

In conclusion, the authors wish to express their appreciation to their friends in the paper industry, and to associates at the Bayonne Laboratories of the International Nickel Co. for their patient, and painstaking work on the corrosion tests.

Steam Savings by Forced Circulation Evaporation*

By W. T. Hinckley[1]

In the utilization of process steam in a soda or sulphate pulp mill, the steam consumed for the evaporation of the black liquor is generally between 35 and 45 percent of the total. It is therefore evident that the steam economy in the evaporator room has an appreciable bearing on the steam balance of the mill. It is the purpose of this paper to discuss in a general way some of the steam savings effected by the application of forced circulation evaporators to this operation.

Multiple Effect Evaporation

The evaporation required per ton of pulp will vary considerably with the character of the wood used, the cooking process, the amount of total alkali charged to the digesters, the percent recovered in the washing operation, the concentration of the liquor from the wash room and the concentration required for the recovery units. In the case of a mill employing a multiple effect evaporator, followed by disc evaporators and rotary furnaces, about 75 per cent of the total evaporation to dryness takes place in the multiple effect evaporator. Under the usual operation, discharging liquor at about 45 per cent solids (24 degrees Baume at 200 deg. F.) to the disc evaporators, the evaporation and multiple effect is generally between 10,000 and 12,000 pounds of water per ton of pulp produced.

The steam required for a given quantity of evaporation will be governed principally by the number of effects in the evaporator, but is also dependent on the steam pressure at the first effect, the vacuum at the last effect, the arrangement of the liquor heaters that may be used, the liquor flow through the layout and the disposal of the condensate.

A quadruple effect is most often used and may be a horizontal tube, a vertical tube, a film type or a forced circulation vaporator.

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 15-18, 1932. Written discussion of this paper is welcome and should be sent to M. H. Teaze, 200 Fifth Ave., New York, N. Y.
Contribution of the TAPPI Heat and Power Committee.
[1] Chemical engineer, Swenson Evaporator Company, Harvey, Illinois.

With a fixed set of operating conditions, the calculated steam economy of an evaporator will be determined by the heat balance of the layout and will be theoretically the same regardless of the type of evaporator used. In practical operation, however other factors enter into the problem which govern the steam consumption per ton of pulp produced, as well as the operating economy of the evaporator room. Since the additional steam savings obtained in the forced circulation system are a result of the type of construction used in the evaporator, a brief consideration of the principles involved will be of direct interest.

The capacity of a multiple effect evaporator is determined by:

(1) The total working temperature drop, or the difference in temperature between the steam to the first effect and the vapor from the last effect, minus the total of the excess boiling points of the liquor in the various effects.

(2) The temperature of the feed liquor.

(3) The liquor flow through the evaporator.

(4) The over-all coefficient of heat transfer.

(5) The heating surface in each effect of the evaporator and intermediate heaters.

The first three of these factors are governed to a great extent by the plant conditions and the method of operation. The last two factors are determined largely by the design of the evaporator.

The coefficient of heat transfer expressed as B.t.u. per square feet per degree temperature difference per hour depends upon the velocity of the steam at the surface of the tubs, the effectiveness of air and condensate removal, the conductivity of the metal used in the tubes, the condition of the tube surfaces, the viscosity of the liquor in the various effects, and the velocity of the liquor or the rate of circulation. Because of the relative resistance to the flow of heat from the steam to the metal, through the metal and from the metal to the liquor, a change in the steam film coefficient or in the conductivity of the metal has a relatively small effect on the over-all coefficient. A variation in the liquid film coefficient, however, has a relatively great effect on the over-all coefficient. Since the viscosity of the liquor is fixed by the concentration and the temperature in each effect, it follows that the liquor velocity remains as a variable through which the over-all coefficient can be affected to the greatest extent. A concrete example of this phenomenon is shown by the fact that in pumping liquor through a tubular heater, a rate of heat transfer is obtained equal to several times the rate obtained in a natural circulating evaporator working at the same liquor density and viscosity and the same mean temperature difference.

In the forced circulation evaporator this principle is applied by forcing the liquor by means of a low head, high efficiency pump through relatively long, small diameter vertical tubes. The liquor is heated in the passage through the tubes, flashes against an inverted parabolic deflector and the vapor is disengaged from the resulting rapidly descending curtain of liquor. Due to the high coefficient of heat transfer obtained at the high liquor velocity and with an effective steam travel through the heating element, the heating surface required for a given capacity is only a fraction of that required in a natural circulation evaporator. As a result, it then becomes possible to use tubes of a corrosion proof alloy of more expensive metals, which would be prohibitive from the standpoint of investment charges in the case of a natural circulation evaporator with the large amount of heat-surface. Because of the long life of the alloy tubes, these may be expanded into the steel tube sheets to form a leak-proof construction.

Corrosion of Tubes

In any steel tube evaporator, working on black liquor, it is necessary to replace the tubes after a period of time due to failure from corrosion. The tubes cannot be satisfactorily inspected without removing them from the evaporator and consequently, it is usually the practice to make the replacements as the failures appear on testing the evaporator during a shut down period. As a result, during a part of the operating period, leaks in the tubes are existent. With frequent shut downs and testing, this leakage may be kept to a minimum, but in other cases under longer periods of operation, the leakage slowly develops to the point where it materially reduces both the steam economy and the capacity of the evaporator. The use of alloy tubes of chome-nickel steel, such as KA-2, in the forced circulation evaporator eliminates this leakage and results in a higher average steam economy and lower maintenance cost.

Another source of steam consumption which does not appear in the calculated heat balance of an evaporator is the steam required for boiling out. In the case of mills using wood of high rosin content, such as the kraft mills in the South, there is a tendency of rosin soap compounds to precipitate out of the liquor in the evaporator. Unless special methods are employed for settling or filtering out the insoluble soap compounds and suspended organic matter before the liquor goes to the evaporator, it becomes necessary to empty the evaporator at intervals and boil out with water

In horizontal tube evaporators gummy deposits of insoluble rosin soap compounds tend to form between the tubes, reducing the rate of circulation and hence the capacity, and with the usual operation on liquor of high rosin content, boil outs are necessary at least once a week and often two or three times a week. Vertical tube evaporators, in general, suffer less from this action and the operating cycle is considerably extended, in some cases to several weeks. In the forced circulation evaporators, however, the liquor velocity through the tubes and the rate of circulation of the small volume of liquor in process prevents the collection of soap deposits in the evaporator and the constant rate of evaporation can be maintained indefinitely. The additional steam economy obtained by the elimination of boil outs depends entirely upon the case used for comparison, and while in some cases relatively small compared to the other economies, it should be considered in the general average.

The largest item in the additional steam economy obtained from a forced circulation evaporator results from the fact that, due to the construction of the heating element, all the condensate from the steam supplied to the evaporator can be returned to the boiler feed water system. In the case of evaporators with steel heating surface and gasketed tubes, this is seldom considered safe practice, because of the possibility of contamination of the boiler feed water with black liquor from leaks, a very small quantity of liquor causing violent foaming in the boiler.

The magnitude of this saving can best be shown by an example of a quadruple effect evaporator working between 35 pounds steam pressure and a 26 inch vacuum on feed liquor of 16 per cent solids at 170 deg. F. and discharging the concentrated liquor from the first effect at 45 per cent solids and 220 deg. F. The evaporation is then between 2.85 and 3.0 pounds of water per pound of steam used, depending upon the method of feeding the liquor to the last three effects. This does not include any evaporation from condensate flash or any credit for heat returned in condensate, but does allow for radiation and venting losses, since the figures used are based on actual plant tests. At an evaporation of 11,000 pounds of water per ton of pulp and 2.90 pounds per pound of steam, this requires 3,800 pounds of steam per ton of pulp.

The condensate, however, is returned to the boiler feed at the temperature of the 35 pounds steam in the first effect. The heat of the liquid above boiler fed make-up water at 70 deg. F. is 281 minus 70 equals 211 B.t.u. per pound and the latent heat of the steam at 35 pounds pressure is 923. The steam equivalent of the heat thus returned to the boiler is then $3800 \times \frac{211}{211 + 923} = 705$ pounds of steam per ton of pulp. Giving the evaporator credit for this extra heat to the boiler room makes the net equivalent steam consumption for evaporation 3095 pounds per ton of pulp.

For comparison with the above example, if the condensate in the first effect were flashed in succession through the steam chests of the second, third and fourth effect and removed from the evaporator at the temperature of the fourth effect, the resulting steam economy can be calculated. Multiplying the additional condensate quantities by the ratio of the temperature drops to the latent heat in each effect gives the following amounts of additional evaporation:

$$3800 \times \frac{281 - 237}{974} = 172 \text{ pounds evaporation in 2nd effect.}$$

$$3972 \times \frac{237 - 207}{997} = 130 \text{ pounds evaporation in 3rd effect.}$$

$$4102 \times \frac{207 - 167}{1021} = 160 \text{ pounds evaporation in 4th effect.}$$

Total 462 pounds evaporation from condensate flash.

The equivalent steam consumption to be deducted from the steam required for evaporation is then $\frac{462}{2.9} = 160$ pounds of steam per ton of pulp, as compared to 705 pounds when the condensate is returned to the feed water system.

In either of the above cases, the condensate from the second and third effects can be flashed through the fourth effect, as this can be done equally well in any type of evaporator. The additional evaporation would then be 296 pounds per ton of pulp, or an equivalent of 102 pounds of steam per ton of pulp. Basing the steam savings accomplished by the above methods on the total steam flow to the evaporator, the saving by flashing the condensate from all effects out through the fourth effect would be 7 per cent of the total. Returning the condensate from the first effect to the boiler, the steam saving is 18.5 per cent if the condensate is discharged direct, and 21.2 per cent if the second and third effect condensate is flashed into the fourth effect. This does not consider the additional economies in the boiler room due to returning a large amount of water from the process steam used in the plant. In mills operating at high boiler pressure, where the feed water problem becomes an important factor that is of especial advantage, since the evaporator then becomes part of a closed system.

There is a difference of opinion regarding the practical advantages of flashing the condensate through all effects and in many cases the amount of net gain is doubtful. Where mechanical traps are used there are likely to be difficulties with operation on the low pressure differential and in such cases the tendency of the operators is to by-pass the traps, allowing appreciable quantities of steam to flow through to the last effect with the water, resulting in a loss of economy. In cases of high steam cost, however, it is obviously profitable to equip the evaporator with a flash system and give it the attention required.

The number of factors entering into the determination of the total operating economy of an evaporator installation make it impossible to set up any figures of general application. Each case must be calculated separately on the basis of the costs that prevail. The steam savings of the forced circulation evaporator must be balanced against the additional power requirements. In some cases where power costs are high in proportion to steam costs, a combination of natural circulation bodies with a forced circulation first effect is more economical, but with the usual relation of power and steam costs, the balance is on the other side. In addition to the steam economies it is necessary to consider the reduced maintenance cost of the forced circulation evaporator, as well as the economies resulting from the continuity and ease of operation in which the entrainment problem of foamy liquors is completely solved.

Concentration to High Density

In a soda or sulphate mill employing recovery furnaces into which the liquor is sprayed at 65 to 70 per cent solids, the questions of steam consumption for evaporation and steam production from the furnaces are so closely related that any consideration of one problem involves the other. A discussion of steam production is quite outside the scope of this paper, but it is of interest to note the relations of steam quantities where a forced circulation concentrator is used.

The most economical arrangement from the standpoint of investment and operating cost will usually be found in the use of a quadruple effect evaporator, operating on low pressure steam and discharging the liquor at about 24 degrees Baume and 220 deg. F. or about 45 per cent solids. The final evaporation to 68 per cent solids or 38 degrees Baume is then accomplished in a forced circulation concentrator using steam from a higher pressure line, generally at 100 pounds to 200 pounds pressure. The vapor from the concentrator is then exhausted to the steam chest for either the first or second effect of the multiple effect evaporator. In the case of a forced circulation first effect on the multiple effect evaporator, the concentrator vapor being exhausted to the second effect allows returning to the boiler feed water the condensate from the steam used in the multiple effect. The condensate from the concentrator may be returned direct at the high pressure, or flashed to the pressure of the concentrator vapor line and returned along with the condensate from the multiple effect evaporator.

In a quanitative study of the process, it is necessary to know as accurately as possible the amount of total solids per ton of pulp, the ratio of inorganic to organic matter and the heating value of the organic matter. These appear to vary widely for different cases, but in any case, with the arrangement outlined above, it will be evident from calculated comparisons that the higher the density of the liquor out of the concentrator, the greater the balance of net steam production, regardless of the increased amount of steam used in the concentrator. This results from the fact that water evaporated in the furnace removes heat from the system in direct ratio to the B.t.u. carried out as latent heat in the stack gas, but if evaporated in the concentrator, is used again at multiple effect economy.

The question of the relative economy of concentrating to high density in multiple effect at low steam pressure involves not only the operating difficulties of handling a very viscous liquor at lower temperatures, but involves also the equipment costs. By using a concentrator on high pressure steam, the most difficult stage of the evaporation is carried out at a high temperature difference, lower viscosity and a small amount of heating surface. If this is done in multiple effect, the concentrations are raised throughout the evaporator and the coefficient of heat transfer reduced to a point considerably below those obtained in evaporating to 24 degrees Baume. The investment in equipment is then much greater and would be justified only in special cases influenced by steam costs and the balance in the power plant.

The possibilities of carrying out the entire evaporation process at elevated temperature has never been developed in this country, but has been used to some extent in Europe. In this system, high pressure steam is used on the first effect of a multiple effect evaporator, which, instead of exhausting from the last effect to a condenser, furnishes steam at low pressure for use in the driers of the paper machine. A cleaning valve is required to remove the corrosive gases from the vapors, but this difficulty could also be overcome by the use of an additional effect on the evaporator designed to operate on pure water forming a closed system with the drier condensate equipment. The forced circulation evaporator is particularly well adapted for this type of service, since it can be constructed for high body pressure and can work economically at very low temperature drops. This would be especially true at the high temperature at which the coefficient in forced circulation would be very high and at the same time, there should be less trouble with the foaming of the liquor in the forced circulation evaporator. This latter point would be important because of the increased tendency of the black liquor to foam at a higher temperature. This field appears to offer possibilities for greatly increased fuel economies.

1864 1932

"EXCELSIOR" FELTS

for every grade of

PULP AND PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made the first endless paper machine felts manufactured in America.

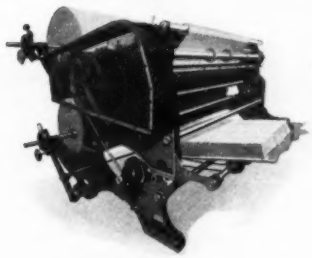
Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

SOLD BY

BULKLEY, DUNTON & COMPANY
75-77 Duane St., N. Y., and direct

H-S MACHINE CO.



New High Speed Towel Interfolder

Will fold from 30 to 40 cases of standard Interfolded Towels per hour. Ball bearing throughout. Accurate and noiseless in operation.
We manufacture stock machines for every converting purpose and design special equipment to meet any paper converting problem.

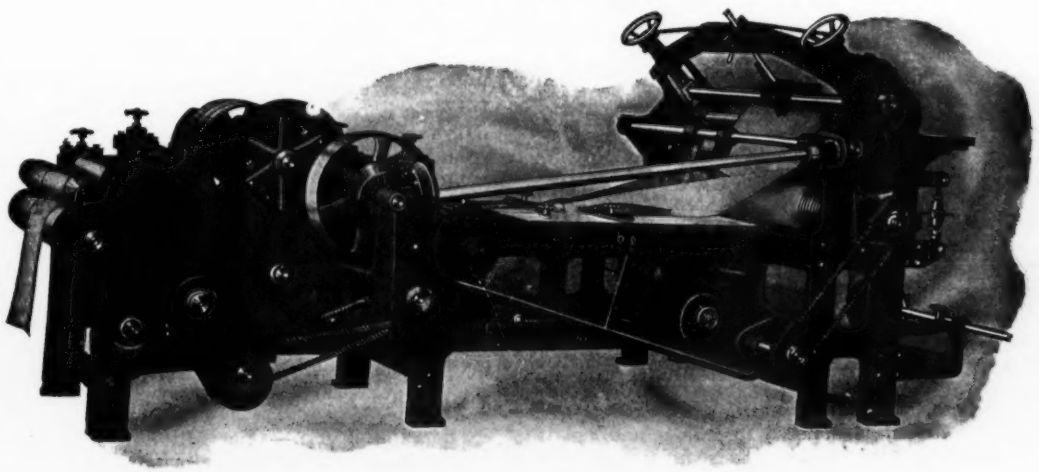
—Write for further information—

Hudson-Sharp Machine Co.
GREEN BAY, WISCONSIN
Chicago Office: 574 Wrigley Bldg.
Manufacturers and Designers of Special Machinery

"For over a century Builders of Machines for making High Grade Papers"

OUR HEAVY DUTY TUBER PAPER BAG MACHINE

of sturdy build, is designed for speed and uniform production.
Used today by largest converters.



THE SMITH & WINCHESTER MFG. CO.
South Windham, Conn.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Philadelphia, Pa.—The Whiting-Patterson Company, Inc., 320 North 13th street, operating a paper converting plant, has taken title to the five-story building at 417 Locust street, with three-story structure in rear, forming an L-shaped unit. It is understood that company will occupy buildings for general operations.

East Rutherford, N. J.—The Flintkote Company, 100 East 42nd street, New York, with main executive offices in the Park Square Building, Boston, Mass., manufacturer of paper roofing and kindred products, has taken bids on general contract for a new addition to plant at East Rutherford, to be two-story, reported to cost over $40,000, with equipment. Karl A. Lefren, Inc., 171 Madison avenue, New York, is engineer.

New York, N. Y.—The Shomer-Majestic Box Corporation, recently organized by Louis and Paul Shomer, 171 Wooster street, New York, with capital of $75,000, plans operation of local plant for the manufacture of paper boxes and containers. Max Fisher, 345 West Thirty-fifth street, is interested in the new company.

Kingsport, Tenn.—The Tennessee-Eastman Corporation, Kingsport, a subsidiary of the Eastman Kodak Company, Rochester, N. Y., has begun operations at its recently completed mill for the manufacture of a new wrapping material, produced from cellulose acetate. New product is of transparent character and will be marketed under name of Kodapak. It is proposed to advance manufacture at an early date, placing the mill on close to capacity schedule as soon as possible. A working force has been engaged for the new line of output. The plant represents an investment of about $1,000,000, and has been in course of construction for a number of months.

Green Island, N. Y.—The Colonie Fiber Company sustained a fire loss at its local mill recently. An official estimate of damage has not been made. The loss will be replaced.

Richmond, Va.—The Hopper Paper Company, Richmond, has awarded a general contract to Allen J. Saville, Inc., Electric Building, for the construction of a new one-story storage and distributing plant at South Richmond, reported to cost close to $25,000, with equipment. Work will be placed under way at once.

Dubuque, Iowa—The Maizewood Products Corporation, Railroad avenue, manufacturer of wallboard products, using cornstalks as raw material, has secured low bid from W. L. Yokom, Dubuque, for the rebuilding of its mill recently destroyed by fire. It is understood that award will soon be made and superstructure placed under way. It will be one and four-story, 60 x 500 ft., estimated to cost close to $125,000, the amount of the fire loss, including equipment. A list of machinery to be installed has been arranged. A. Byron Hunicke is plant engineer.

New York, N. Y.—The Herz Cup Company, Inc., recently organized with a capital of $10,000, by Frank P. Pigott, 248 Aetna street, Brooklyn, N. Y., and associates, plans operation of local plant for the manufacture of paper cups and kindred products. Joseph D. Allen, 230 East Fortieth street, New York is interested in the new organization.

Danville, Ill.—The Merle Sears Paper Box Company, Danville, has arranged for an increase in capital from $30,000 to $250,000, for general operations and expansion.

Fredericksburg, Va.—The new addition to the mill of the Sylvania Industrial Corporation, Fredericksburg, recently referred to in these columns, will provide for the employment of about 75 additional operatives at the plant, making a total working quota of over 575 persons. The plant unit is expected to be ready early in March, and machinery will be installed closely following. The expansion is reported to cost over $90,000, with equipment. General contract has been let to Doyle & Russel, Central National Bank Building, Richmond. The company specializes in the production of a transparent wrapping material resembling paper, made from cellulose products.

New York, N. Y.—The Madison Paper Box Company, care of Irving D. Korn, 401 Broadway, attorney, recently organized with a capital of $10,000, is said to be planning operation of a local factory for the manufacture of paper boxes and containers.

Pawtucket, R. I.—The Metz Paper Company, Tweed and Harris streets, has superstructure under way on a new one-story addition to plant for storage and distributing service, for which general contract recently was let to Henry M. Soule, 110 Brook street. It will be about 70 x 95 ft., reported to cost close to $20,000, with equipment. Early occupancy is planned.

Dryden, Ont.—The Dryden Paper Company, Ltd., is continuing production on a curtailed basis at its local mill for the manufacture of kraft and manila wrapping paper stocks. It is proposed to hold to present basis for some weeks to come.

Bury, England—C. S. Oiserman, Ltd., London, England, operating an agency for foreign paper manufacturers, has purchased the former mill of the Geigg Paper Company, Bury, in conjunction with affiliated paper interests, and expects to place the plant in service at an early date. The mill has been shut down for more than a year past. Improvements and repairs will be made to equipment.

Philadelphia, Pa.—The Mundial Corporation has been organized with a nominal capital of $5,000, to manufacture and deal in paper products of various kinds. The incorporators are G. P. and Gabriel Middleton, and E. Stanley Richardson. The company will be represented by Walter S. March, 407 State Road, Cynwyd, Pa., treasurer.

Arthur D. Little, Inc.

Chemists and Engineers to the Pulp and Paper Industry for over Forty Years

Laboratories and Experimental Mill

30 CHARLES RIVER ROAD, CAMBRIDGE, MASS.

Hardy S. Ferguson & Co.

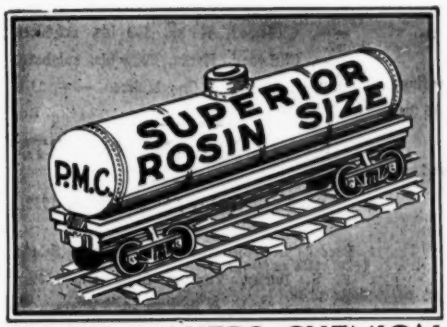
Consulting Engineers

200 Fifth Avenue, New York City

Hardy S. Ferguson.....Member A.S.C.E., A.S.M.E., E.I.C.
Moses H. Teaze .....Member A.S.M.E., E.I.C.
J. Wallace Tower .....Member A.S.C.E., A.S.M.E.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants
Dams and other Hydraulic Structures.



20 plants to serve You

PAPER MAKERS CHEMICAL CORP.
Kalamazoo, Michigan

V. D. SIMONS

INDUSTRIAL ENGINEER

Pulp and Paper Mills, Hydro-Electric and Steam Power Plants, Electrification Paper Mill Properties.

435 No. Michigan Ave.
CHICAGO, ILL.

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation	Paper and Pulp Mills
Reports	Hydro-Electric and
Valuations	Steam Power Plants
Estimates	Plans and Specifications

The uses of Liquid Chlorine

are rapidly expanding, so we are improving our facilities, and are prepared to ship promptly in Tank Cars, Multi-Unit Tank Cars (1-ton containers), or Cylinders (150 lbs. or 100 lbs.) from either Philadelphia, Pa., Wyandotte, Mich., Menominee, Mich., or Tacoma, Wash.

Inquiries and general correspondence should be addressed to our Philadelphia Office

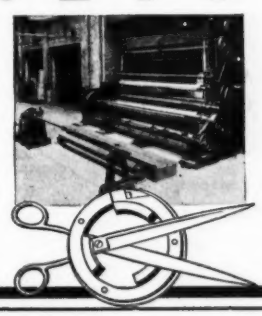
Pennsylvania Salt Mfg. Company

Incorporated 1850.

Widener Building, Philadelphia, Pa.

Representatives:
New York Pittsburgh Chicago St. Louis
Works:
Natrona, Pa. Wyandotte, Mich.
Philadelphia, Pa. Menominee, Mich.
Tacoma, Wash.

LANGSTON SLITTERS



FOR clean, square-edged, tightly wound rolls, Langston Slitters are unequaled. The Shear-Cut parts the paper cleanly—instead of *crushing* it. Ask for details.

Samuel M. Langston Co., Camden, N. J.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JANUARY 23, 1932

SUMMARY

Cigarette paper	54 cs.
Wall paper	44 bls., 12 cs.
Paper hangings	12 bls., 2 cs.
News print	5433 rolls
Printing paper	36 cs.
Drawing paper	11 cs.
Filter paper	17 cs.
Decalcomania paper	39 cs.
Metal coated paper	38 cs.
Gold coated paper	4 cs.
Tissue paper	18 cs.
Felt paper	14 bls.
Book paper	111 bls.
Card board	67 cs.
Card board boxes	4 cs.
Miscellaneous paper	147 cs.

CIGARETTE PAPER

Max Speigel & Son, Pr. Harding, Hamburg, 4 cs.
Champagne Paper Corp., France, Havre, 50 cs.

WALL PAPER

Irving Trust Co., A. Ballin, Hamburg, 11 cs.
F. A. Binder, A. Ballin, Hamburg, 7 bls. 1 cs.
Globe Shipping Co., A. Ballin, Hamburg, 11 bls.
Bush Service Corp., A. Ballin, Hamburg, 1 ble.
J. E. Bernard & Co., A. Ballin, Hamburg, 7 bls.
F. J. Emmerich, A. Ballin, Hamburg, 18 bls.

PAPER HANGINGS

W. H. S. Lloyd & Co., Port Hunter, London, 2 cs., 12 bls.

NEWS PRINT

W. H. Bell, Markland, Liverpool, N. S., 5433 rolls.

PRINTING PAPER

E. Dietzgen & Co., Inc., Veendam, Rotterdam, 36 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Port Hunter, London, 11 cs.

FILTER PAPER

C. Schleicher & Schull Co., Inc., A. Ballin, Hamburg, 10 cs.
H. Reeve Angel & Co., Inc., Port Hunter, London, 7 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Antonia, Liverpool, 30 cs. (duplex).
L. A. Consmiller, Europa, Bremen, 3 cs.
C W. Sellers, Europa, Bremen, 6 cs.

METAL COATED PAPER

J. J. Shore & Co., A. Ballin, Hamburg, 10 cs.
Globe Shipping Co., A. Ballin, Hamburg, 28 cs.

GOLD COATED PAPER

F. Murray Hill Co., Europa, Bremen, 4 cs.

TISSUE PAPER

Old Master Paper & Pulp Co., Pr. Harding, Hamburg, 2 cs.
Schwarz Paper Co., Antonia, Liverpool, 16 cs.

FELT PAPER

Heemsoth, Basse & Co., Veendam, Rotterdam, 14 bls.

BOOK PAPER

——, California, Glasgow, 111 bls.

CARD BOARD

American Express Co., A. Ballin, Hamburg, 61 cs.
Winsor, Newton, Inc., Port Hunter, London, 6 cs.

CARD BOARD BOXES

Framerican Import Co., Pres. Adams, Marseilles, 4 cs.

MISCELLANEOUS PAPER

Schenckers, Inc., A. Ballin, Hamburg, 2 cs.
Steiner Paper Co., Veendam, Rotterdam, 12 cs.
Globe Shipping Co., Veendam, Rotterdam, 2 cs.
American Express Co., France, Havre, 1 cs.
Standard Products Corp., France, Havre, 86 cs.
Simfred, Inc., France, Havre, 12 cs.
Keller, Dorian Paper Co., France, Havre, 7 cs.
Japan Paper Co., France, Havre, 12 cs.
C. Steiner, France, Havre, 3 cs.
——, France, Havre, 10 cs.

RAGS, BAGGINGS, ETC.

Chemical Bank & Trust Co., Tomalva, Rotterdam, 41 bls. rags.
R. F. Downing & Co., California, Glasgow, 110 bls. rags; 60 bls. bagging.
J. Cohen & Son, Veendam, Rotterdam, 12 bls. rags.
M. Snedeker Corp., Antonia, Liverpool, 44 bls. paper stock.
I. Hinerfeld, Vincent, Havre, 11 bls. rags.
V. Galaup, Vincent, Havre, 114 bls. rags.
H. G. Lichtenstein, City of Flint, Leith, 492 bls. rags; 131 bls. bagging.
——, Cypria, Barcelona, 69 bls. bagging.
Chemical Bank & Trust Co., Cypria, Barcelona, 121 bls. bagging.

HIDE GLUE

H. Bierschenk & Co., Veendam, Rotterdam, 200 bags.
——, A. Ballin, Hamburg, 300 bags.

WOOD FLOUR

The Burnet Co., Tomalva, Rotterdam, 1000 bls., 40750 ks.
The Burnet Co., Veendam, Rotterdam, 500 bls.
State Chemical Co., Veendam, Rotterdam, 700 bags.

WOOD PULP

——, Vogesen, Hernosand, 3000 bls. sulphite, 500 tons.
Johaneson, Wales & Sparre, Inc., Vogesen, Sundsvall, 750 bls. wood pulp, 152 tons; 9000 bls. sulphite, 1825 tons.
K. Lundahl, Inc., Vogesen, Sundsvall, 2000 bls. sulphite, 406 tons.
Bulkley, Dunton & Co., Vogesen, ——, 2500 bls., wood pulp, 508 tons.
Castle & Overton, Inc., A. Ballin, Hamburg, 420 bls. wood pulp, 84 tons.
Lagerloef Trading Co., Cliffwood, Helsingfors, 1278 bls. sulphite, 213 tons.
——, Cliffwood, Kotka, 842 bls. sulphite, 142 tons.
——, Cliffwood, Kotka, 2200 bls. sulphate, 367 tons.
Bulkley, Dunton & Co., Malmen, ——, 2375 bls. wood pulp.

NEW ORLEANS IMPORTS

WEEK ENDING JANUARY 23, 1932

Porsans & Whittemore, Inc., Vogesen Sundsvall, 1029 rolls news print.
E. S. Butler, Vogesen Sundsvall, 1729 rolls news print.
Johaneson Wales & Sparre, Inc., Vogesen Sundsvall, 500 bls. sulphite.

BALTIMORE IMPORTS

WEEK ENDING JANUARY 23, 1932

Congoleum Nairn Co., Vincent, Dunkirk, 75 bls. rags.
Congoleum Nairn Co., Vincent, Havre, 505 bls. rags.
Pagel, Horton & Co., Inc., Cliffwood, Husum, 15600 bls. sulphate, 2600 tons.
Pagel, Horton & Co., Inc., Cliffwood, Hornefors, 17400 bls. sulphite, 2900 tons.
Bulkley, Dunton & Co., Toledo, ——, 5500 bls. wood pulp.
Bulkley, Dunton & Co., Ditmar, Koel, ——, 8750 bls. wood pulp.
Gottesman & Co., Inc., Ditmar Koel, Sweden, 12408 bls. wood pulp.
Gottesman & Co., Inc., Murjek, Sweden, 6180 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING JANUARY 23, 1932

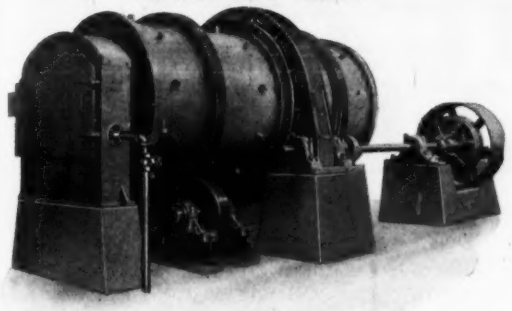
G. F. Malcolm & Co., Antonia, Liverpool, 30 bls. tissue paper.
F. S. Webster & Co., Antonia, Liverpool, 17 bls. tissue paper.
W. H. Proctor & Co., Antonia, Liverpool, 4 cs. tissue paper.
Atkinson, Haserick & Co., Pres. Adams, Genoa, 1 cs. paper.
Bulkley, Dunton & Co., Malmen, ——, 1975 bls. wood pulp.
Bulkley, Dunton & Co., Gunda, ——, 13616 bls. wood pulp.
Bulkley, Dunton & Co., Carplaka, ——, 14400 bls. wood pulp

PORTLAND IMPORTS

WEEK ENDING JANUARY 23, 1932

Gottesman & Co., Inc., Malmen, Sweden, 1800 bls. wood pulp.
Gottesman & Co., Inc., Toelda, Sweden, 16750 bls. wood pulp.

MARCY ROD MILLS



Marcy Open End Rod Mills For Perfect Beating Of Every Type Of Stock.

1. Positively reduces power costs.
2. Absolute control under all conditions.
3. Maximum preservation of initial strength.
4. Preserves full fibre length.
5. Positive separation of fibre bundles.
6. Positively no unbeaten stock bypassed.

Send us a sample of your untreated pulp and we will send you proof.

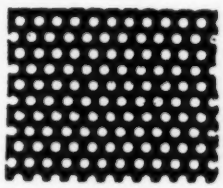
PAPER MILL DIVISION

The MINE and SMELTER SUPPLY COMPANY

Denver, Colorado

Perforated Metal Screens

For Pulp and Paper Mills



".065" Round

STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

CHARLES MUNDT & SONS

63-65 FAIRMONT AVE. JERSEY CITY, N. J.

PERMANENT COLORS

Browns Greens Reds Yellows

BROWNS
Oxides of Iron
Turkey Umbers

GREENS
Chromic Oxides
Guignet's Green

REDS
All types and shades of Oxides of Iron

YELLOWS
Ochres
Iron Hydroxides

Asbestines and Talcs for Fillers

C. K. WILLIAMS & CO.

EASTON, PA.

Dietz Towel Interfolding Machines

also

TOILET PAPER MACHINES

For making Toilet and Paper Towel Rolls (With or without perforations)

AUTOMATIC TUBE MACHINES

For Making Wire-Stitched Toilet Tubes

Sanitary Crepe Towel Machines, Roll Tighteners, Slitting and Rewinding Machines, Drop Roll Slitting Machines, Photo Mount Beveling Machines, Rotary Card Cutting Machines, etc.
Correspondence solicited

DIETZ MACHINE WORKS

126-128 W. Pontaine Street
Cor. Waterloo St. (between Front & Second Sts.) and below Diamond St.
Phila., Penna., U. S. A.

Fourdrinier Wires, all widths up to 300 inches

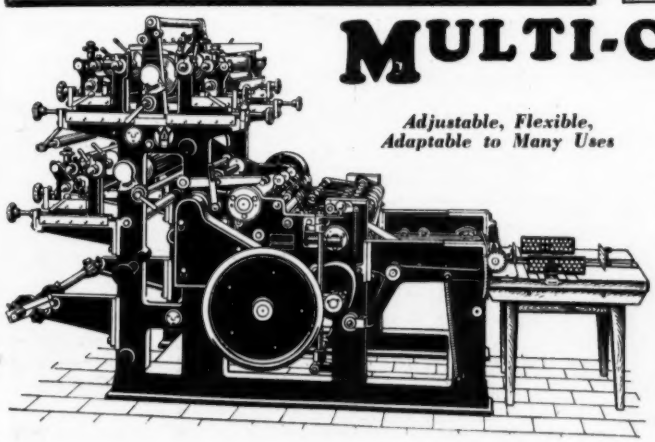
DIMOND WIRES

NEUMEYER & DIMOND

Established 1904

82-92 Beaver St. New York

MULTI-COLOR Aniline Press



Adjustable, Flexible, Adaptable to Many Uses

3 or 4 colors. Slits and rewinds the web, or cuts it up into sheets of various sizes. Cuts a straight (not serrated) edge. Can be used as a separate unit or directly connected with reel-fed bag or other machines. Also adjustable to print both sides at once.

For printing on CELLOPHANE, as well as glassine, all printing papers, kraft, etc. Prints continuous background patterns, fancy box wrappings, candy wrappers, and various rolls used by paper goods, tissue and bag manufacturers. Two models, with reel widths of 19¾ and 39⅜ respectively. Speeds up to 7700 yards of web or 9000 sheets per hour.

Manufactured by Windmoeller & Hoelscher

H. H. HEINRICH, INC.

200 Varick Street, New York

New York Market Review

Office of the PAPER TRADE JOURNAL.
Wednesday, January 27, 1932.

During the past week, the local paper market was more buoyant than of late. Demand for the various standard grades of paper is gradually expanding. The price situation, also, is improving. Sales forces of the leading paper houses are conducting a strenuous campaign for business and are becoming more optimistic regarding the future.

No radical changes were reported in the news print market. Production in the United States and Canada is being maintained at approximately 55 per cent of rated capacity. Shipments are going forward in fairly satisfactory volume. Merger negotiations are still going on, with a view to stabilizing the industry.

Some improvement was noticed in the paper board market. Box board output is being maintained at about 64 per cent of capacity. The fine paper market is fairly active although prices are irregular. Tissues are moving in moderate volume. Quotations are spotty, due to intense competition. The coarse paper market is in a sound position. Recently revised prices of kraft are holding up well.

Mechanical Pulp

Steadiness prevails in the ground wood market. Production, both at home and abroad, has been curtailed, and there are no excessive accumulations. There are some promising inquiries around for future delivery. Prices on domestic and imported mechanical pulp are firmer than of late.

Chemical Pulp

The position of the chemical pulp market in practically unchanged. Demand for the various grades of imported and domestic chemical pulp is fairly persistent, especially considering the general business depression. Imported bleached sulphite is quoted at from $2 to $3, and No. 1 strong unbleached at from $1.50 to $1.75, on dock, Atlantic ports.

Old Rope and Bagging

Quietness continues to reign in the old rope market. Demand from the paper mills for both domestic and imported old manila rope is light at present. Small mixed rope is dull. The bagging market is listless. Little interest is being displayed by the mills in either scrap or gunny. Prices are nominal.

Rags

The domestic rag market is showing some signs of improvement. Cotton rags are in better request than for some time past. Roofing grades are going forward to the mills in fairly satisfactory volume. Prices are practically unaltered. The imported rag situation continues unsatisfactory, due to some extent to the uncertainty of foreign exchange.

Waste Paper

With the inventory period out of the way, the paper board manufacturers are beginning to show more interest in the lower grades of paper stock, and more lively trading is anticipated in the near future. The better grades of waste paper are exhibiting a strong undertone, especially book stock, which is in good request. Ledger stock, also, is in more persistent demand.

Twine

Demand for twine is moderately active, although most of the business transacted of late has been along routine lines. Inquiries for future needs are fairly numerous and the future outlook is encouraging. Prices of the various grades are generally holding to previously quoted levels.

TAPPI CONVENTION PROGRAM

(Continued from page 25)

Industrial Management Problems in Russia, by Walter N. Polakov, consulting engineer, New York, and formerly engineering management advisor to the Supreme Economic Council of U. S. S. R. (Russia). Dr. Polakov's address will be illustrated by many interesting slides.

Note: The final luncheon of the association is provided as a fitting climax to our meetings. This is the third annual luncheon and we have again been fortunate to have three speakers on our program that we know will enable the association to maintain the excellent reputation it now has relative to this affair.

Boston Paper Market Fairly Active

BOSTON, Mass., January 25, 1932—A fair amount of business has been transacted in the Boston paper market during the last week. In some cases orders have been coming in with more briskness and in greater volume than during the previous week. Bonds and ledgers have been moving in fair quantities. The call for writing is sustained. Printers continue to show an interest in having dummies made up and samples provided; in one instance, at least, these calls have been extremely heavy, indicating that printers are going after business among the customers employing direct mail advertising. More demand for book papers has developed.

West Dudley Paper Mills to Reopen

WEST DUDLEY, Mass., January 26, 1932.—L. P. Emerson, president of the West Dudley Paper Company, writes as follows: "Some of the newspapers have published a very exaggerated report on the fire that occurred in our storehouse yesterday morning, and we wish to give you the correct details. The fire was confined to part of the waste paper storehouse, damaging about 10 carloads of waste paper, 3 carloads of pulp, a small amount of finished paper and a large part of the roof of the storehouse. The heat went through into the turbine room, damaging the power switch board. The total loss will amount to between $25,000 and $30,000. The plant will be down for a few days, but we expect to start operating again on Monday of next week."

FREDERICK L. SMITH
21 EAST 40TH STREET, NEW YORK
PULP AND PAPER MILL ENGINEER

KARL A. LEFREN, Inc.
CONSULTING ENGINEERS
171 Madison Ave. New York City

MISCO "C"
THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
MICHIGAN STEEL CASTING CO., DETROIT, MICH.

Appleton Wires
are good wires
APPLETON WIRE WORKS INC., APPLETON WIS.

"THE FOURDRINIER THAT TOOK THE IRE OUT OF WIRE"
INTERNATIONAL WIRE WORKS
Menasha, Wisconsin

KRAFT-WELD
GUMMED SEALING TAPE
"GET THE BEST"
PAPER MANUFACTURERS CO. Inc.
PHILADELPHIA, PA.

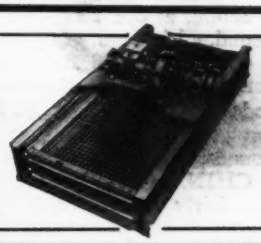
Filter Deckers — Pulp Washers Save-Alls
FILTRATION ENGINEERS INCORPORATED
SERVICE ECONOMY
Portland, Ore. Newark, N. J.
In Canada: Watt Machinery & Equipment Co., Montreal, Que.
Northern Foundry and Machine Co., Sault Ste. Marie, Ont.

De Laval
Steam Turbine Co., Trenton, N. J.
Steam Turbines, for all speed and steam conditions; capacities up to 15,000 hp. Catalog D45. Helical Gears. Catalog R45. Centrifugal Pumps, for all capacities. Catalog B45. Centrifugal Blowers and Compressors. Catalog F-45. Worm Reduction Gears. Catalog R45. Flexible Couplings. Catalog K45. Water Wheels. Catalog T45.

JOHNSON & WIERK, INC.
PULP AND PAPER MILL ENGINEERS
Grand Central Terminal Bldg. NEW YORK, N. Y.
246 Stuart Street, BOSTON, MASS.

KELLOGG *Masterweld*
DUCTILE — TOUGH
DIGESTERS . . Boiler Drums . . Headers . . Receivers
Separators and Complete Power Plant Piping
THE M. W. KELLOGG CO., 225 Broadway, New York City
Birmingham, Boston, Chicago, Los Angeles, Tulsa

The Jeahy Chip Screen
The Deister Concentrator Co.
(Incorporated 1906)
923 Glasgow Ave., Fort Wayne, Indiana
New York Office: 104 Pearl St., New York City



USED BY MILLS MAKING OVER 80% OF THE COUNTRY'S PAPER
VACUUM PUMPS
Nash Hytor
AIR COMPRESSORS
NASH ENGINEERING CO. SOUTH NORWALK, CONN.

MELVIN R. WARE
PRACTICAL PAPER MILL CONSULTANT
Specializing in
Automatic Paper-Making Systems
"Direct" White Water Systems
Beater Control Systems
GLYNDON, MARYLAND

UNITED STATES TESTING COMPANY, Inc.
1415 Park Avenue, Hoboken, N. J.
Paper: Microscopical, physical and chemical tests. T.A.P.P.I. standards followed. Constant humidity conditions.
Woodpulp: Evaluated for quality, strength, bleachability, alpha cellulose, moisture.
NEW YORK PHILADELPHIA CHICAGO
PATERSON PROVIDENCE SCRANTON
READING GREENSBORO

INTERNATIONAL PULP CO.
NEW YORK CITY
ASBESTINE FILLER
Reg. U. S. Patent Office 90% Retention

"YOUR PAPER IS MADE IN YOUR BEATERS"
Dilts
MACHINE WORKS Inc. FULTON, N.Y.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, January 27, 1932.

BLANC FIXE.—The position of the blanc fixe market is unchanged. Contract shipments are moving in fair volume. The pulp is quoted at from $42.50 to $45 per ton; while the powder is selling at from 3¼ cents to 3⅜ cents per pound, in barrels, at works.

BLEACHING POWDER.—Trading in the bleaching powder market is moderately active. The contract movement is fairly heavy. Prices are generally holding to schedule. Bleaching powder is quoted at from $1.75 to $2 per 100 pounds in drums, at works.

CASEIN.—Quietness reigns in the casein market. Domestic standard ground is quoted at 7½ cents and finely ground at 8 cents per pound. Argentine standard ground is selling at 8½ cents and finely ground at 9½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is fairly active. The contract movement is normal. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—Conditions in the china clay market are fairly satisfactory. Prices are holding to formerly quoted levels. Imported china clay is selling at from $11 to $13 per ton; while domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—The chlorine market is displaying a steady trend. While demand is restricted, the contract movement is fair. Prices are holding to schedule. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—Business in the rosin market is quiet. Prices are slightly easier. Grades of gum rosin used in the paper mills are quoted at from $3.55 to $4 per 280 pounds in barrels, at works; while wood rosin is selling at $3.80 per 280 pounds, in barrels, on dock.

SALT CAKE.—No radical changes were reported in the salt cake market. Salt cake is quoted at from $15 to $16; chrome salt cake at from $12 to $13 per ton, in bulk, at works. Imported salt cake is selling at from $14.50 to $15 per ton, ship side.

SODA ASH.—Some improvement was noticed in the soda ash market. Demand is more active and the contract movement is steady. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1; in bags, $1.25; and in barrels, $1.38.

STARCH.—Most of the business transacted in the starch market was along routine lines. Prices are holding to previously recorded levels. Special paper making starch is quoted at $2.54, in bags; and at $2.81, in barrels, per 100 pounds, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is exhibiting a strong undertone. Prices remain unchanged. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—Demand for sulphur is listless. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Paper mill demand for talc is seasonal. Supplies are going forward at a normal pace for the time of year. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at mine; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@38.00
Bonds	5.00	@53.25
Index	6.00	@12.00
Writings—		
Extra Superfine	6.50	@15.00
Superfine	6.25	@14.75
Tub sized	4.50	@ 7.00
Engine sized	3.00	@ 5.00
Book, Cased—		
S. & S. C.	5.25	@ —
M. F.	3.75	@ 5.00
Coated and Enamel	6.25	@ 9.75
Lithograph	6.75	@11.25
Tissues—Per Ream—		
White No. 1	.65	@ .70
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
White No. 2	.50	@ .60
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middies	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¼	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¼	@ —

(Delivered New York)

News, per ton—		
Roll, contract	53.00	@ —
Rolls, spot	53.00	@ —
Sheets	58.00	@ —
Side Runs	38.00	@42.00
Kraft—		
No. 1 Domestic	4.75	@ 6.00
No. 2 Domestic	3.25	@ 4.00
Southern	3.25	@ 4.00
Imported	3.50	@ 4.30
Boards—per ton—		
News	24.00	@27.50
Straw	34.50	@45.00
Chip	24.00	@27.50
Binders' Boards	62.00	@70.00
Standard 85 Test Liner	32.50	@37.50
Sgl. Mla. Ll. Chip	32.50	@37.50

(F. o. b. Mill)

Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	22.00	@24.00
Dry	22.00	@24.00

(F. o. b. Mill)

No. 1 Domestic	20.00	@28.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	2.00	@ 3.00
Easy Bleaching	1.60	@ 1.75
No. 1 strong unbleached	1.50	@ 1.75
Mitscherlich unbleached	1.55	@ 1.75
No. 2 strong unbleached	1.40	@ 1.50
No. 1 Kraft	1.50	@ 1.75
No. 2 Kraft	1.40	@ 1.50
Sulphate—		
Bleached	2.35	@ 2.50

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	2.00	@ 4.00
Easy Bleaching	1.75	@ 1.90
News	1.50	@ 1.65
Mitscherlich	2.40	@ 2.55
Kraft (Domestic)	1.60	@ 2.75

(Delivered Paper Mills)

Soda Bleached	2.50	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	6.50	@ 7.00
New White, No. 2	5.50	@ 6.00
Silesias No. 1	5.25	@ 5.50
New Unbleached	7.00	@ 7.50
New Blue Prints	4.00	@ 4.50
New Soft Blacks	3.50	@ 4.00
Blue Overall	5.00	@ 5.25
Fancy	3.00	@ 3.50
Washables	2.75	@ 3.00
Mixed Khaki Cuttings	3.50	@ 4.00
Pink Corset Cuttings	5.00	@ 5.50
O. D. Khaki Cuttings	4.50	@ 4.75
Men's Corduroy	3.00	@ 3.50
New Mixed Blacks	3.00	@ 3.25

Old Rags

White, No. 1—		
Repacked	5.25	@ 5.75
Miscellaneous	4.25	@ 4.75
White, No. 2—		
Repacked	3.00	@ 3.50
Miscellaneous	2.30	@ 2.50
St. Soiled, White	1.50	@ 1.75
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.65	@ 1.85
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.25	@ 1.30
No. 1	1.25	@ 1.30
No. 2	.90	@ 1.00
No. 3	.70	@ .80
No. 4	.65	@ .70
No. 5A	.50	@ .60

Foreign Rags

New Rags

New Dark Cuttings	1.40	@ 1.50
New Mixed Cuttings	1.60	@ 1.75
New Light Silesias	3.40	@ 3.50
Light Flannelettes	3.75	@ 4.00
Unbleached Cuttings	5.50	@ 6.00
New White Cuttings	4.75	@ 5.00
New Light Oxfords	4.00	@ 4.25
New Light Prints	2.00	@ 2.25

Old Rags

No. 1 White Linens	5.25	@ 5.50
No. 2 White Linens	4.50	@ 4.75
No. 3 White Linens	3.25	@ 3.75
No. 4 White Linens	1.75	@ 2.25
No. 1 White Cotton	4.00	@ 4.25
No. 2 White Cotton	3.00	@ 3.25
No. 3 White Cotton	2.25	@ 2.50
No. 4 White Cotton	1.40	@ 1.50
Extra Light Prints	1.90	@ 2.10
Ord. Light Prints	1.60	@ 1.75
Med. Light Prints	1.40	@ 1.55
Dutch Blue Cottons	1.35	@ 1.40
French Blue Linens	2.00	@ 2.25
German Blue Linens	2.00	@ 2.10
German Blue Cottons	1.20	@ 1.25
Checks and Blues	1.25	@ 1.30
Lindsay Garments	.75	@ .80
Dark Cottons	.70	@ .75
Old Shopperies	.55	@ .60
New Shopperies	.60	@ .65
French Blues	1.25	@ 1.30

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.10	@ 1.20
Domestic	1.15	@ 1.25
Wool Tares, light	1.00	@ 1.05
Wool Tares, heavy	1.00	@ 1.10
Bright Bagging	1.00	@ 1.05
Small Mixed Rope	.90	@ 1.00
Manila Rope—		
Foreign	1.50	@ 1.60
Domestic	1.50	@ 1.75
New Burlap Cut	1.70	@ 1.80
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	2.55	@ 2.75
Hard, white, No. 2	1.90	@ 2.00
White envelope cuttings	2.05	@ 2.15
Soft, white, No. 1	1.70	@ 1.80
Flat Stock—		
Stitchless	.70	@ .80
Overissue Mag.	.70	@ .80
Solid Flat Book	.60	@ .70
Crumped No. 1	.45	@ .50
Solid Book Ledger	1.75	@ 1.85
Ledger Stock	.60	@ .70
New B. B. Chips	.20	@ .30
Manilas—		
New Env. Cut	1.75	@ 1.85
New Cuttings	1.40	@ 1.50
Extra No. 1 old	1.05	@ 1.15
Print	.45	@ .50
Bogus Wrapper	.45	@ .50
Container	.25	@ .30
Old Kraft Machine—		
Compressed bales	1.00	@ 1.10
News—		
No. 1 White News	1.60	@ 1.65
Strictly Overissue	.35	@ .45
Strictly Folded	.25	@ .30
No. 1 Mixed Paper	.15	@ .20
Common Paper		Nominal

Chemipulp Process

A method of recovering HOT gas and liquor in sulphite process

Saves Steam Saves Time Saves Sulphur

Increases Production

Eliminates Expensive Cooling Equipment

Reduces Boiler Peak Load Draw

CHEMIPULP PROCESS, INC.

330 Woolworth Bldg., Watertown, N. Y.
1017 White Bldg., Seattle, Wash.

in Canada
319 Castle Bldg., Montreal, Que.

THE CLARK-AIKEN CO.

Successors to
H. C. Clark & Son Machine Co.

PAPER MILL MACHINERY

LEE, MASS.

Revolving Paper Cutters—Rag Cutters—Cylinder Paper Machines—Washing and Beating Engines—Chilled Iron and Paper Calenders—Fan and Stuff Pumps—Engine Roll Bars and Bed Plates—
Cylinder Molds—Marshall Drives—Slitters and Rewinders—Reels—Dryers with Improved Packing Boxes—Wet Machines—Gun Metal and Rubber Rolls—Rolls Reground.

E. D. JONES & SONS CO.,
PITTSFIELD, MASS.

MANUFACTURERS OF

PAPER MILL MACHINERY

Appleton
Felts and Jackets

Appleton Woolen Mills, Appleton, Wisconsin

Your Card in This Space Will Bring Results

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, Index Bristol, Post Card and Label Papers

High Grade Coated Book

also

KRAFT WRAPPING AND KRAFT ENVELOPE

Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

230 Park Ave., New York — 35 East Wacker Drive, Chicago
503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

WATER SOFTENING ZEOLITE

BASEX

for

Replacement in All Makes

of

ZEOLITE WATER SOFTENERS

Send for Leaflet A and Sample

INVERSAND COMPANY
CLAYTON, NEW JERSEY

CASEIN

CMCo BRAND

ANY GRADE — ANY QUANTITY

THE CASEIN MFG. COMPANY OF AMERICA, Inc.

205 E. 42nd St. New York, N. Y.

Oldest and Largest Producers of Casein in America

Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.11¾	@	.12¾
Tube Rope—			
4-ply and larger	.09¾	@	.11¾
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine			
Balls	.08¾	@	.10¼
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.23	@	.28

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	05	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.50	@	5.00
Southern Kraft	3.25	@	—
No. 2 Kraft	3.25	@	—
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	53.00	@	—
Sheets	58.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	1.75	@	1.85
No. 1 Soft White	1.60	@	1.65
Ledger & Writings	.70	@	.75
Solid Books	.70	@	.75
Blanks	1.30	@	1.35
Krafts	1.15	@	1.25
New Kraft Cuts	1.30	@	1.45
Manila Env. Cuts	1.60	@	1.75
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.50
Old Newspapers—			
No. 1	.35	@	.45
No. 2	.30	@	.40
Mixed Papers—			
No. 1	.25	@	.30
No. 2	.25	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.09
Manila Sul., No. 1	.03	@	.05
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.04
Southern Kraft No. 2	—	@	.03¾
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	30.00	@	32.00
Chip Board	25.00	@	27.50
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	63.00	@	65.00
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06½
New White, No. 2.	.05	@	.05½
Light Silesias	.05	@	.05½
Silesias, No. 1	.06	@	.08
Black Silesias, soft.	.05	@	—
New Unbleached	.06	@	.06½
Washable, No. 1	.02½	@	.03
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02	@	.02½
New Blue	.02	@	.02½
Fancy	.03	@	.03¼
New Black Soft	.03	@	.03½
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O.D.	.04½	@	.05
No. 2 Mixed	.03½	@	.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed.	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.25	@	2.75
M. G.	4.50	@	—
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.75	@	2.00
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.10	@	2.20
No. 2 Hard White.	1.75		2.10
No. 1 Soft White.	1.50	@	1.70
No. 2 Soft White.	1.40	@	1.50
No. 1 Mixed.	.45	@	.55
No. 2 Mixed.	.40	@	.50
Solid Ledger Stock.	1.20	@	1.30
Writing Paper.	.60	@	.75
No. 1 Books, heavy.	.60	@	—
No. 2 Books, light.	Nominal		
No. 1 New Manila.	1.25	@	1.50
No. 1 Old Manila.	1.00	@	1.25
Print Manila.	.45	@	—
Container Manila.	.35	@	.40
Old Kraft.	.90	@	1.00
Common Paper.	.20	@	—
No. 1 Mixed Paper.	.15	@	.25
Straw Board, Chip.	.25	@	.35
Binders Board, Chip.	.25	@	.35
Corrugated Board.	.25	@	.35
Overissue News.	.40	@	.50
Old Newspaper.	.30	@	.35

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11½
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	.03¼	@	.03½
(F. o. b. Boston)			
Southern Kraft	.03¼	@	.03½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	—	@	56.50
Straw Board, rolls	.009	—	@52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	.27.50	@	30.00
Chip Board	—	@	25.00
Chip Board (Creasing)	.27.50	@	30.00
Single Manila Lined Chip	—	@	35.00
Single White, Patent Coated News Board—			
Binder	.52.50	@	60.00
Wood Pulp Board	.70.00	@	75.00
Binder Boards	.67.50	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.50
No. 2 Hard White	2.25	@	2.50
No. 1 Soft White	1.50	@	1.75
No. 2 Mixed	.50	@	.55
No. 1 Mixed	.75	@	.85
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.65	@	.75
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	.80	@	.90
White Blank News	1 35	@	1.45
Kraft No. 1	—	@	.85
Manila	.90	@	1.00
No. 1 Mixed Paper	.17½	@	.20
Print Manila	.35	@	.40
Overissue News	.35	@	.40
Old Newspapers	.22½	@	.27½
Box Board, Chip	.17½	@	.20
Corrugated Boxes	.32½	@	.37½

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.00
Domestic	—	@	1.10
Manila Rope—			
Foreign	1.25	@	1.50
Domestic	—	@	1.50
Transmission Rope	—	@	1.25
Mixed String	.25	@	.35
Jute Rope	—	@	1.00
Jute Carpet Threads	.75	@	.90
Bleachery Burlap	—	@	2.25
Scrap Burlap	—	@	.85
No. 1 Scrap Burlap	—	@	.90
Scrap Sisal	1.15	@	1.25
Scrap Sisal for shredding	—	@	1.25
Wool Tares, heavy	1.00	@	—
New Burlap Cutting	1.50	@	1.75
Australian Pouches	—	@	1.50
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	.75	@	.85
Bagging No. 2	—	@	.40
No. 1 Burlap	—	@	3.50

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1.	—	@	.05¼
New White No. 2.	—	@	.04
Silesias No. 1	.04½	@	.05
New Black Silesias	.02½	@	.02¾
New Unbleached	.05½	@	—
Fancy	—	@	.03¾
Washable	—	@	.03½
Cottons—According to grades—			
Blue Overalls	—	@	.05
New Black, soft	.04	@	.04¼
Khaki Cuttings	.03	@	.03½
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03¾
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	—	@	4.00
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	—	@	1.50
Thirds and Blues—			
Repacked	—	@	.85
Miscellaneous	1.00	@	1.20
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	.48	@	.53
No. 2	.43	@	.48
No. 3	.38	@	.43

Foreign Rags
(F. o. b. Boston)

Dark Cottons	—	@	.55
New No. 1 White Shirt Cuttings	5.00	@	5.50
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.55	@	1.65
Old Linsey Garments	.65	@	.70

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.11¾	@	—
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (Carloads)	6.65	@	—
No. 3 M. F. (Carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.60	@	—
White Wrap	5.10	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.60	@	—
Fiber	5.60	@	—
Kraft, M. F.	5.98	@	—
Kraft No. 2	5.60	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	56.50	@	57.00
Sheets	61.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	44.00	@	—
Sulphite, bleached	62.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.85	@	—
Soft White	2.40	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	.80	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut	1.70	@	—
Printed Manilas	.65	@	—
Kraft	1.75	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

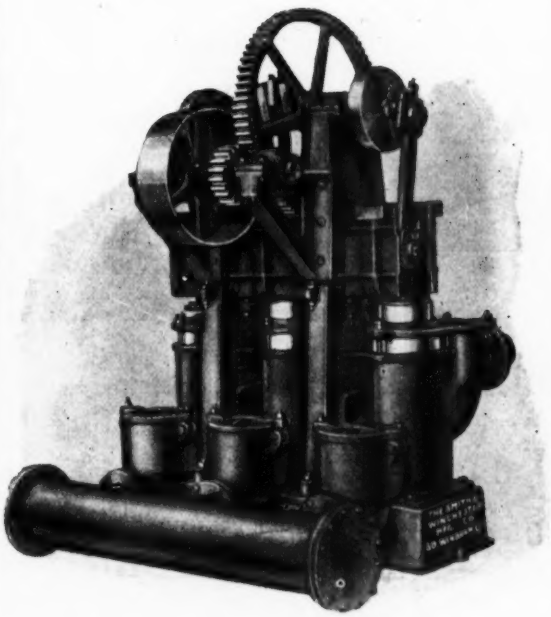
Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¼

STUFF PUMPS

OUR "TRIPLEX" STUFF PUMP

is on a par with all other Pulp and Paper Mill Equipment we manufacture. The fact of its satisfactory use in leading mills attests its efficiency.



Built for service, it handles stock with speed and assurance of satisfactory results.

The SMITH & WINCHESTER MFG. CO.

SOUTH WINDHAM, CONN.

FOR OVER A CENTURY BUILDERS OF

FOURDRINIER and CYLINDER MACHINES, PAPER BAG MACHINES, JORDAN ENGINES

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTIETH YEAR

Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President: J. BANNINGA, Sec.-Treas.

Published at 34 No. Crystal St., East Stroudsburg, Pa.
Executive and Editorial Offices: 10 East 39th Street, New York
Chicago Office: 123 West Madison St.

TABLE OF CONTENTS

Copyright, 1932, by the Lockwood Trade Journal Co., Inc.

Makes Awards for Government Printing	11
Paper Demand Active in Chicago	19
Canadian Pulp and Paper Men Meet	20
The President's Address	20
Paper Mill Mutual Reports	26
Algonquin Paper Co. Elects Officers	26
Consolidated Water Power & Paper Progress	29
Threat to Pulp Industry	29
Compulsory Unemployment Insurance	29
Case & Risley in Healthy Condition	29
Pennsylvania Mills Extend Operations	30
Paper Trade Association Elects Officers	30
Waste Merchants Plan Banquet	30
N. L. Nourse Talks on Paper	30
New Department at Keasby & Mattison	30
Aetna Insulations Changes	30
Electric City Paper Mills Buys Plant	30
Canadian Box Makers Plan Convention	31
Optimism Expressed	31
Entertainment Committee Appointed	31
St. Regis Chooses Directors	31
Program for Paper Week	32
Wood Pulp Manufacturers Meetings	32
Editorial	**36**
L. E. Jonte Dead	37
Bids and Awards for Government Paper	37
Beckett Paper Co. Makes Improvements	37
Bill to Regulate Envelopes	37
Technical Section	
Pulp and Paper Industry Literature Review	39
Water Resistance of Papers	42
Materials of Construction Committee Report	45
Handling and Drying of Single Coated Paper	46
Drying Paper on Yankee Driers	49
Power Plant Section	**51**
Obituary	54
Improved Lavino Chrome Brick	54
Imports of Paper and Paper Stock	56
New York Market Review	**60**
Miscellaneous Markets	**62**
Market Quotations	**62**

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 70-71

Air Washed Clay—Ground Clay—Crude Clay
Capacity 100,000 tons per year.

R. T. VANDERBILT CO.

230 Park Ave.
New York

RAYOX — (PURE TITANIUM DIOXIDE)

You will find that a small percentage of Rayox added to your clay will give that increased opacity that you have been looking for.

The white pigment of highest known opacity value. Technically it is the whitest and brightest of all white pigments.

It has the highest hiding power and tinting strength and the greatest resistance to chemical change of any known white opaque pigment.

Rayox may also be successfully used to increase the finish and opacity of your coating solution.